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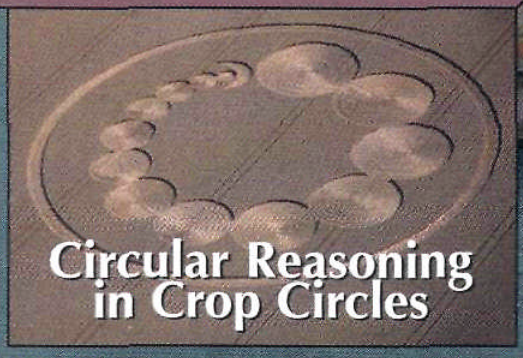
Skeptical Inquirer

THE MAGAZINE FOR SCIENCE AND REASON
Volume 26, No. 5 • September/October 2002

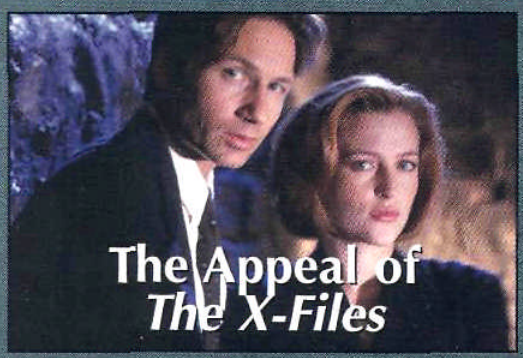
A Skeptical Look at September 11th

SPECIAL REPORT



Circular Reasoning in Crop Circles

Can We React More Rationally to Terrorism?



The Appeal of *The X-Files*

- Sheldrake's Crystals: A Critique . . . and a Reply From Sheldrake
- Teaching Skepticism
- Skepticism Under the Big Sky

Published by the Committee for the Scientific Investigation of Claims of the Paranormal

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11 SEPTEMBER 2001 - Dallas, Texas: Jeanie Quest, left, and Phillip Jabour react to photographs of the terrorist attack on New York City and Washington D.C. September 11, 2001 in a special edition of the *Dallas Morning News*. Credit: Ian Halperin/UPI

Crop circles, Avebury, England. Credit: Ron Russell/Index Stock Imagery

David Duchovny (L) as Agent Fox Mulder and Gillian Anderson as Agent Dana Scully. ©1998 Fox Broadcasting Company. Credit: Mark Seliger/Fox

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EDITOR'S NOTE

One Year After September 11

It has been a year since the terrible attacks of last September 11. Much has changed since then. In this issue Clark R. Chapman (Southwest Research Institute) and Alan W. Harris (Jet Propulsion Laboratory) take what they call "A Skeptical Look at September 11." While not questioning the reality of the visceral fears caused by the attacks—and the responsible reactions to them—they argue that our reaction to the attacks was disproportionate and that this in turn was as damaging as the direct destruction of lives and property. They suggest that Americans can mitigate future terrorism by learning to respond more objectively to future malicious acts.

As horrible as the attacks were, Chapman and Harris point out that the total death toll was far less than the 20,000 people who died in a single earthquake in India earlier last year and also less than U.S. highway fatalities in every single *month*, including September of 2001.

Later in their article, they discuss the problem of risk perception, and of course they are right that we humans so personalize things that we have a skewed sense of what poses the most and the least risks to us. Shark attacks get enormous publicity, but only about ten people a year worldwide are killed by sharks. Twenty-thousand Americans were expected to die from influenza in the winter of 2001–2002, but that got little publicity. The social dynamics of risk perception are fascinating, but one can hardly complain that people don't number-crunch risk-assessment data like a computer; people take more intuitive assessments that even *can* have their own psychological rationality.

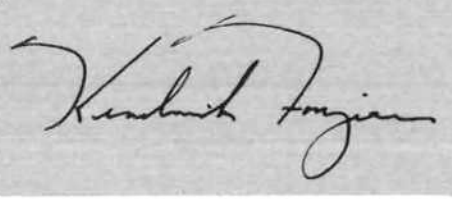
Chapman and Harris clearly have a broad perspective (they are planetary scientists), and that perspective is shaped by worries about the risk of an event that could, as they say, send civilization all the way back to the Dark Ages—an impact into the earth of a kilometer-size asteroid. To them, these various comparisons suggest that the United States' post 9/11 expenditures have been lopsidedly large and that a more balanced approach would be advisable and better for society.

I share their frustration about our skewed risk assessments, and I had my say about the September 11 events in my Commentary "Clear Thinking and the Forces of Unreason" in our March/April 2002 issue. Still, there are some additional points that, in my personal view, might be made:

The authors are using the deaths/damage from the attacks of September 11 as a lone point of comparison. But, to be fair, we don't know how many other possible attacks have been averted or deterred by the actions and resolve of the military, the government, and the civilian society.

In general, I think the response of the American public in supporting the necessities of the fight against terrorism has been highly positive and for the most part rational and proportional.

Nevertheless, Chapman and Harris present an important set of arguments about our reactions—and possible overreactions—to terrorist events that have been a turning point in U.S. history.



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Fourth World Skeptics Conference in Burbank a Lively Foment of Ideas

Scams, intelligent design, urban legends, fringe psychotherapies get critical attention

KENDRICK FRAZIER and BENJAMIN RADFORD

Prospects for Skepticism
The Next Twenty-Five Years

Nearly 500 people attended CSICOP's Fourth World Skeptics Conference June 20–23 in Burbank, California, hearing a first-ever opening session on confidence games and financial scams, a fascinating semi-debate-format session on evolution and intelligent design (featuring, among others, evolutionary biologist Kenneth Miller and ID proponent William Dembski), another plenary session on urban legends, and a variety of paired concurrent sessions challenging attendees to make difficult choices about what not to miss.

It seemed impossible not to miss something interesting, however. The concurrent sessions focused on fringe psychotherapies, space-age pseudoscience, medical claims, "The Investigators" (Richard Wiseman, Joe Nickell, Jan Willem Nienhuys), educating our future (moderated by Young Skeptics Program director Amanda Chesworth and featuring, among others, Diane Swanson, author of *Nibbling on Einstein's Brain*, a book about science and skepticism for young people; and Charles Wynn, coauthor of *Quantum Leaps in the Wrong Direction*, a book for the general public about pseudoscience) and the paranormal around the world (with speakers from China, India, Peru, Argentina, Venezuela, Mexico, and Germany).

Toss in a raucous luncheon address by the irrepressible science fiction writer Harlan Ellison (recipient at the awards banquet the next night of CSICOP's Distinguished Skeptic Award), that ranged widely over politics, religion, and skepticism, an evening keynote address by MIT cognitive scientist and artificial intelligence guru Marvin Minsky, and a side-splitting Saturday night awards-banquet stand-up comedy routine by television actor Gabe Kaplan, and all the ingredients were there for an entertaining and mind-expanding three-day intellectual and skeptical feast.

The conference appeared to match up well with its predecessor world skeptics congresses in Amherst, New York (1996), Heidelberg, Germany (1998), and Sydney, Australia (2000).

Due to solid efforts by CSICOP's public relations crew, the news media were well represented, with reporters from BBC Radio, Fox News, the Learning Channel, KABC, the *Burbank Leader*, and Australian Broadcasting Corporation showing up, as well as *The New Yorker*. A correspondent from the Latin American media giant Telemundo was also on hand, interviewing several attendees and speakers for a Spanish-speaking audience.

This one's overall theme, "Prospects for Skepticism: The Next 25 Years," seemed appropriate since CSICOP had just completed a yearlong celebration of its twenty-fifth anniversary. This first-ever West Coast-sited world conference, at the Hilton, Burbank Airport and Convention Center, was hosted by the Center for Inquiry–West, CFI's recently established Southern California outpost for skeptics and humanists, situated a few miles to the south in Hollywood. CFI–West just late last year dedicated the first floor of its new building on Hollywood Boulevard, central to the world's entertainment media, which communicate and miscommunicate so much, good and bad, to global audiences via television and film.

CSICOP founder and chairman Paul Kurtz opened the conference by pointing out that the modern media, with their insatiable interest in "entertainment and titillation," are at the root of the phenomena of interest in the paranormal. In contrast, he noted, CSICOP has pressed for alternative scientific and rational investigation of claims, and "for balanced presentations, not only the pro but the con." Throughout, he said, the broader goal is "public appreciation of the scientific outlook."

"It is the science and the scientific outlook that is truly breathtaking," he said. "You don't need fantasy and fiction to feed the human imagination."

He also noted—as would happen several more times in the conference—the recent death of CSICOP Fellow Stephen Jay Gould, and the losses in previous years of scientist/skeptics Carl Sagan and Isaac Asimov. "Where are the new heroes to emerge today, to integrate science and to explicate and defend science?"

"We've been doing this for twenty-five years," Kurtz said. "This conference is on the next twenty-five years."

Following are brief summaries of several of the key sessions.

Don't Get Taken!

The opening Thursday evening session, "Don't Get Taken," focused on a mostly new subject for CSICOP, confidence games and financial scams. All end up taking innocent people's money, in ways that may seem clever or may seem crude, but nevertheless prey on people's trust.

CSICOP Fellow Robert Steiner, a certified public accountant, professional magician, and author of the book *Don't Get Taken!*, listed several myths about con games:

- The myth that cons are very nice and gentle. Not true.
- You cannot cheat an honest man. "Yes, you can," Steiner countered.
- Con*men*: "Actually some of the greatest con sharks are women."
- Only stupid and naïve people get taken. Wrong!
- Only the greedy get taken. Wrong again!

Most scams have been around in various forms for generations, but some are new. New in just the last few weeks, Steiner said, was one involving an offer to have your name taken off telephone-solicitation lists—something appealing to most everyone. The only request: Give us your social security number!

Richard Lead, an accountant and international taxation specialist (and treasurer of the Australian Skeptics), who writes a regular column on financial scams for the *Australian Skeptic*, expressed outrage at scammers. "How dare they take other people's money!" he said. Scams are bad for two reasons, he said: "Good people lose money. Bad people make money."

The reasons people fall for scams are far more complex than greed. He said they are analogous to optical illusions. In both, "the mind is fooled." He described a wide variety of pyramid schemes, the secret to which is hiding the pyramid with a product. The product may be something people want or it may be essentially worthless, but it disguises the real intent of the pyramid, to make money for the few people at the top, at the expense of all the rest.

Virtually everyone is familiar with the notorious Nigerian letter. ("How many have *not* received one?" Lead asked the audience. Only one hand went up.) Nevertheless the Nigerian letter scam, which seeks the recipient's help in getting large sums of money out of Nigeria under various ruses, continues to draw people in and take their money, or worse. "A friend lost $90,000 to the Nigerian letter," Lead said. "He thought all the others were hoaxes, but that *his* was real!" The Nigerian letter is so successful, Lead said, that $200 million U.S. are flowing into Nigeria each year as a result. And when people whose money has been scammed from them get so upset that they travel to Nigeria to try to find a way to get it back, they can be in mortal jeopardy. "Twenty people are murdered each year who go there," Lead said.

A similar scam is the selling of nonexistent credit cards for a Caribbean tax haven that promises a $4,000 credit. The only thing one has to do to get this wonderful bargain is to send $150 to the tax haven. That's the last they see of their money—or of the credit.

The "Wall Street tease" was the topic of Richard Schroeder, a certified financial planner and registered investment advisor. "I can't think of anything more paranormal than modern Wall Street," said Schroeder. "Most of what Wall Street tells us is baloney and does not work."

Enron, Arthur Anderson, and dot-com IPOs are not the worst Wall Street has to offer, Schroeder said. For decades, he said, Wall Street has lived with a nasty secret: Modern financial markets are efficient and it is next to impossible to beat them. And yet people, shelling out commissions of 0.5 percent to 1 percent, pay $35 billion to $70 billion a year "to handle your investments," with the hope of getting an edge, that *their* expert will be a winner.

Schroeder said fifty years of well-validated academic research show that security investments follow a "random walk"—meaning no useful information is embedded in the historical price information of securities. Schroeder described the research, published in many journals and in the 1973 book *A Random Walk Down Wall Street.*

As for typical advice such as "buy 'undervalued' stock," Schroeder says, "It doesn't work. There are so many brilliant people and so much information so readily available, it is impossible for anyone to gain an advantage." And, he said, the stock market is efficient—it processes all information immediately, so no one has access to information that others can't get.

"Scores of empirical studies for fifty years show . . . no basis for the value of investment management," said Schroeder. "Yet financial management interests continue to charge billions of dollars a year."

Moderator Ray Hyman concluded the session with some remarks on scammers and the psychology of deception. Con games work within a social situation and depend upon the normal workings of social dynamics, he said. They "are a play within a play." "We are social creatures. We've evolved to react to social cues." Furthermore, he said "no one wants to admit that they were taken."

"All these deceptions depend on social trust," Hyman said. "It is because people trust other people that society functions as well as it does—and also why cons work."

The Inimitable Harlan Ellison

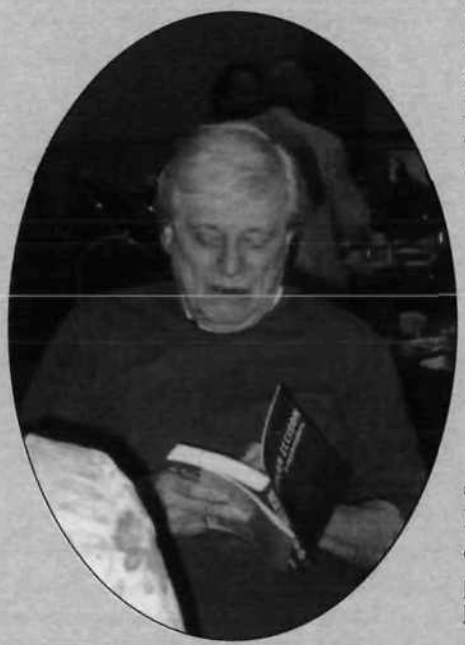
Writer Harlan Ellison gave an entertaining and incisive luncheon address, discussing a proposed appearance on the recently defunct television show *Politically Incorrect*. He was invited, he said, to come and talk about the September 11 terrorist attacks. After long deliberation, Ellison declined to appear on the show because he felt he really had nothing to say about the topic. This of course puzzled and distressed the television producers, who are used to the standard procedure wherein pundits and celebrities are usually rushed on the air to comment on big events of the day, regardless of how ill-informed, self-evident, or repetitive their commentary is. The idea that perhaps social or political commentary should come only after thoughtful deliberation, and not dictated by the demands of split-second broadcasting shows, seems novel in today's media.

Ellison ended his talk by slamming the hypocrisies of religion.

"You want an opinion [he said, metaphorically addressing the TV producers] . . . try this:

"All over the globe, people are being slaughtered in the name of God. . . . It's been that way throughout history, but no one dares 'take religion to task for the evil it has ushered into the world.'

"And don't give me any of that banana oil about all the wonderful things like the Renaissance and illuminated manuscripts that religion has proffered. That's what a man-made succoring faith is *supposed* to do! It's not, however, to do all the *rotten* stuff it does. Like burning Giordano Bruno and turning Galileo into a craven wimp; like stoning witches to death and flinging people onto the *strappado* for the



pleasure of the Inquisitions; like banning books and art and dance; like dynamiting gloriously beautiful ancient Buddhist statues; like telling the gullible and uneducated that they must empty their pockets of milk money as they hate and hate and hate all those with lifestyles unlike the ones Jerry and Pat and Osama trumpet as Moral Values; lifestyles of honor they cannot live up to themselves.

"I have no opinions on what happened September 11, 2001. None that need be voiced, because they're even less informed than yours, and frankly, if you're like me you don't know actual jack. . . ."

* * *

Saturday evening Ellison was presented CSICOP's 2002 Distinguished Skeptic Award. Before the presentation the audience was shown excerpts from a television show Ellison *did* consent to participate in, a talk show in Los Angeles six months earlier about UFOs and aliens.

The others on the show were of course proponents, but Ellison came armed with volumes of documentation of the skeptical arguments. (He says he had wanted to dramatically roll a wheelbarrow full of SKEPTICAL INQUIRERS and skeptical books on stage during the program; the producers only allowed him to have them at the table he was seated at.) Ellison continually blasted back at proponent's claims with facts and succinct, pungent arguments; more than once he pulled out an SI issue or book and read brief sections from it, then gave his own unique stylistic twist to clinch the argument.

It was one of the few times a single skeptic had clearly won out over the promoters of pseudoscience on a television talk show.

—B.R. and K.F.

From left, moderator Massimo Pigliucci and Evolution and Intelligent Design session panelists Paul Nelson, William Dembski, Kenneth Miller (with microphone), and Wesley Elsberry debate the issues. (Photo by Diane J. Blackwood)

Evolution and Intelligent Design

One of the highlights of the conference was the Friday morning plenary session pitting two prominent defenders of evolution, Kenneth Miller and Wesley Elsberry, against two leading proponents of "intelligent design" (ID), William Dembski and Paul Nelson. ID is of course the latest tactical approach of those who seek to dethrone evolution in the schools and contend that intelligent design is a scientific theory, or at least a philosophical theory, that should get some kind of equal billing.

Moderator Massimo Pigliucci, an evolutionary biologist at the University of Tennessee (and author of the just-published book *Denying Evolution*), worked out in advance with the participants a format in which all speakers first made short presentations, followed by a segment in which the participants questioned, and responded to, each other. It made for a lively and interactive session.

Pigliucci began with a historical overview tracing the first critique of intelligent design theory back to Hume in 1779. As for the evolutionary biology, he emphasized that "natural selection is a *satisfying*, not an *optimizing*, process." It is not "survival of the fittest," he said, but "survival of the barely tolerable." Perfection is not required.

He outlined the neo-Darwinian synthesis that draws on insights from modern genetics (mutations and recombinations) and modern paleontology, which has identified several human ancestors. In the modern frontiers of evolutionary science genes and the environment interact and real organisms are seen as a complex outcome of many forces (there is no "beanbag" genetics, he said). There is also much recent research interest in the evolution of development.

He then described modern ID theory (and its leading proponents Phillip Johnson, Michael Behe, and Dembski), various scientific and philosophical responses to ID, and concluded with a list of questions for ID:

1. Is ID a scientific research program? If so, what testable predictions does it make?

2. Is ID a philosophical theory? If so, is it likely to make a valuable contribution to science?

3. Should we teach ID in schools, and if so, in science classes, or elsewhere?

Biologist Wesley Elsberry led off the panelists' presentations with an examination of the "wedge" tactic of the ID movement that, as he says, seeks nothing less than a redefinition of science itself. Appropriate for the conference theme, he began with a "25-year view," first asking why, when there are so many *real problems facing society, should we* be concerned at all about ID?

The answer, he said, is because it aims to affect science education and because its most high-profile advocates are creationists.

He spoke of ID's anti-evolution, anti-science agenda (with its theistic alternative), its social-political wedging tactic, its primarily religious motivation, and its primary institution, the Discovery Institute, with which both of the ID speakers on the panel are affiliated.

He said ID's notorious "wedge" document surfaced in 1999, outlining goals of the Discovery Institute for the next five, ten, and twenty years. The goals included: Attack the definition of science, defeat scientific materialism, and seek to influence education and politics.

The original intention was to carry out research first, but Elsberry said ID advocates started their political agenda before doing the research program. He outlined a variety of ID political activities, including ID-promoting bills in Kansas and Georgia, the Santorum amendment in Congress (which contrary to ID propaganda did not become law), and the 2002 effort with the Ohio Board of Education.

He said when ID proponents are asked what their scientific program has been or what it has accomplished, they can give no satisfactory answer but contend that the reason is they "need more funding." He finds that response "ironic" given the enormous financial support funneling into the ID movement.

"The ID approach is to bypass skeptical scientists and go directly to the public," he said. "Political activism is the primary focus." ID "science" is "on the backburner," he said, "and the pilot light is out."

Paul Nelson, a senior fellow at the Discovery Institute and editor of the ID journal *Origins & Design*, then spoke on "why this debate will not go away in American culture." He asked why ID

should be disqualified a priori. He disagrees with "the rule of methodological materialism," in which the statements of science must invoke only natural things and processes.

"Why not be curious?" he asked. "What if the world were designed? Naturalism might be false. Why not suspend naturalism as an a priori hypothesis and let the evidence decide? The dilemma the scientific community faces is not being open to all possibilities. Naturalism might not be true."

Then it was the turn of Kenneth Miller, whose presentation was titled "Unmasking ID." Miller is a professor of biology at Brown University and author of *Finding Darwin's God.* He has been one of the most outspoken and effective defenders of the scientific integrity of evolutionary biology.

William Dembski's calculations "essentially assume what they are trying to prove," Miller said. In contrast, Darwin's ideas made testable predictions. "His predictions have been fulfilled overwhelmingly by subsequent developments."

"It is disingenuous to speak of design without speaking of creationism," he said. "Design theory is creation(ism)."

ID'ers still say everything is the result of design, said Miller, adding, "A theory that can explain *anything* in reality explains *nothing.*"

He incisively critiqued various ID contentions about biology, including its claims that the bacterial flagellum or the blood-clotting cascade could not have progressively evolved. ID makes the same claim that the Krebs cycle (the cyclic series of chemical changes that result in carbohydrate metabolism and produce energy for living organisms) could not have evolved. "But there is a literature of how it *did* evolve," Miller countered. And, he said, the individual parts do have function.

"Dembski's calculations require an assertion we already know is false," said Miller. "The 'evidence' for ID requires a priori assumptions that an evolutionary pathway to a structure is impossible.

"Intelligent design creationism is nothing more than old-fashioned creationism dressed up in new arguments of information theory and molecular biology," Miller said.

He ended by countering the ID contention that science is closed-minded to the novel. "Science is not hostile to new ideas," he said. Novel ideas lead to new research, which is then subjected to peer review and obtains scientific consensus before reaching the classroom and textbooks.

Intelligent design, said Miller, wants to bypass all that messy science "and go directly to classrooms and textbooks." This was met with prolonged applause.

Dembski, in his presentation, did not so much make any scientific argument as assert the primacy of ID's political and popular power over science and evolution. (Dembski, who has Ph.D.'s in both mathematics and philosophy, is author of *The Design Inference*, among other pro-ID books.)

"Over the next twenty-five years ID will provide the greatest challenge to skepticism," he said. "ID is threatening to be mainstream," he said, asserting that polls show 90 percent support. "ID is already becoming mainstream within the public themselves," he said. "The usual skeptical retorts are not going to work against ID." He contended that ID "turns the tables on skepticism."

Dembski contended that Darwinism "is the ultimate status quo," that it "squelches dissent." Young people, who "love rebellion," see that and are attracted to ID as a result, he claimed. "The public supports intelligent design. The public is tired of being bullied by an intellectual elite." He contended that skeptics resort to rhetoric and "artificially define ID out of science," allowing in only material matters.

Intelligent Design, in contrast, "paints the more appealing world picture" whereas skepticism works by being negative. "This doesn't set well with the public. . . . To most people evolution doesn't provide a compelling view." And to scientists and skeptics who defend evolution and the scientific process Dembski ended with a sarcastic "good luck."

The point/counterpoint segment that followed allowed pointed questioning of speakers' positions. Some of the interactions were interesting indeed. For instance, Nelson at one point referred to a scientific paper on the evolution of the Krebs cycle. He said its authors "cannot close the cycle" unless they *de novo* postulate "a missing enzyme." Without that assumption, "the evidence doesn't work."

Miller asked for a few minutes. He explained he had the paper in question in his laptop computer and would like to find the specific passage. He found the paper, displayed it on the ballroom screen in full pdf format, and went right to the passage, showing where Nelson had misinterpreted its meaning.

Said Miller, in returning to the general point: "In the evolution of metabolism, the achievement of the fundamental steps of the Krebs cycle was not difficult at all. Almost all of its structure primarily existed for very different purposes, and cells had to add just one enzyme . . . to convert a collection of different pathways into the central cyclic pathway of metabolism."

At another point the two ID proponents were asked if they believed in the great age of the earth. Nelson answered that the earth's age didn't matter to him. Dembski said, "ID is not dependent upon any particular view of the age of the earth. It is not relevant."

Miller then returned to the question: "Paul, how old do you think the earth is?"

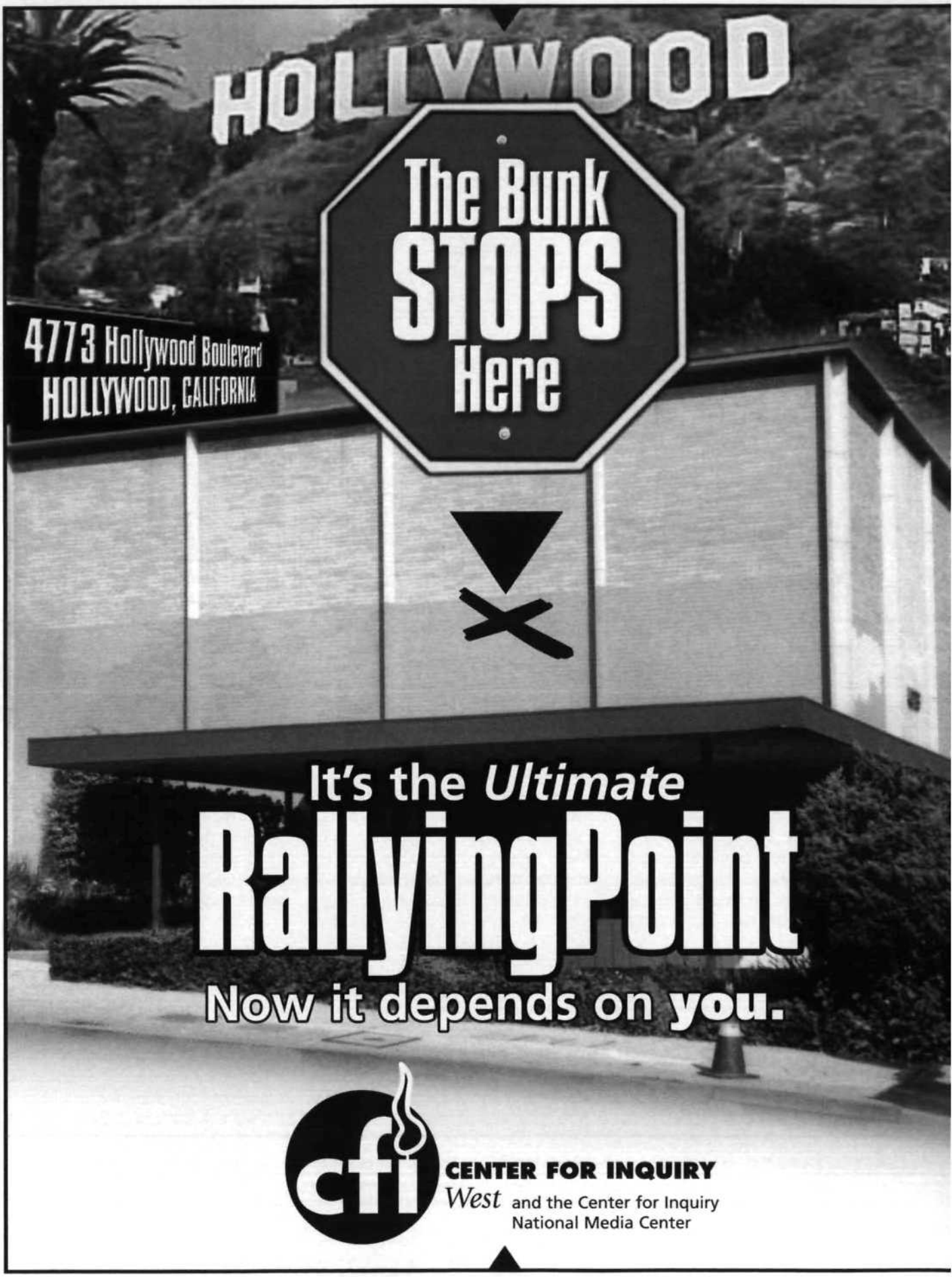
Nelson (after a pause): "It's well known I have a young-earth position."

Miller: "That is not so hard, was it?"

Nelson: "I still think it's irrelevant." He said skeptics ask the earth-age question "because they get rhetorical mileage out of it."

To Nelson's credit, he, in contrast with Dembski, was generally amiable in his interactions with the skeptics. He contended at the beginning that he himself was a skeptic and he liked the questioning attitude of skeptics when he reads the SKEPTICAL INQUIRER.

Nelson also consented to appear in an impromptu informal late afternoon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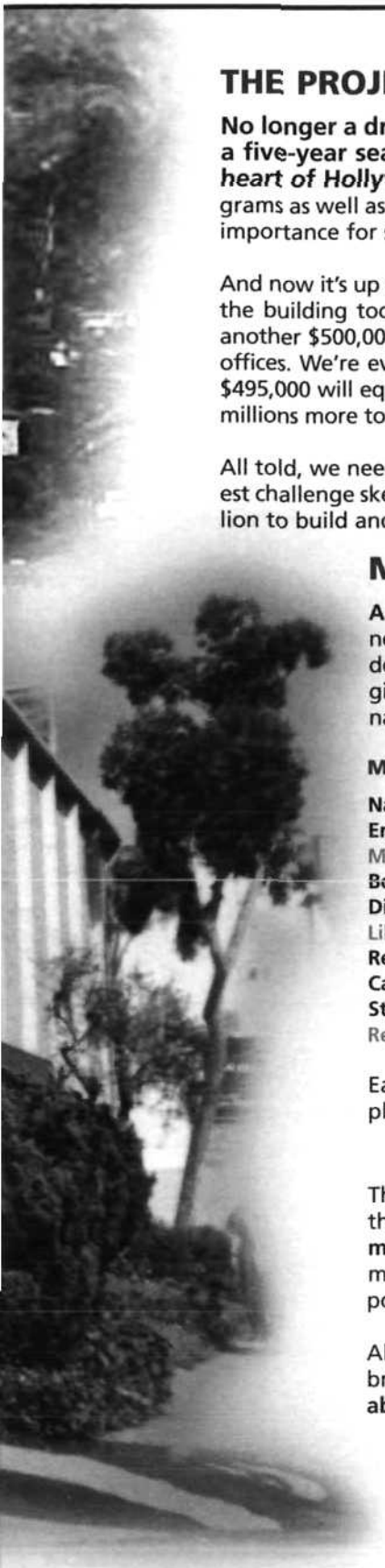

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No longer a dream, reality has begun for our permanent Center for Inquiry – West. After a five-year search we have purchased a building at 4773 Hollywood Boulevard, in the heart of Hollywood. *This ultimate Rallying Point for skeptics will house CFI-West's regional programs as well as Center for Inquiry's™ new national Media Center.* This development has enormous importance for supporters of critical thinking everywhere, **especially** readers of *Skeptical Inquirer.*

And now it's up to our readers and friends. Only **you** can help us fulfill this bold potential. Purchasing the building took $1.6 million, which we must pay back over three years. Renovation will require another $500,000 – creating a 99-seat auditorium, library, exhibit area, media production center, and offices. We're even looking into solar panels so we can generate our own electricity! An additional $495,000 will equip the Media Center and fund its first three years of operation. Finally we must add millions more to endowment, so the new Center will always be fiscally stable.

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question-and-answer session the next day in a room off the conference hotel lobby for a continuation of the back-and-forth discussions with Elsberry and Pigliucci (Miller had left), again moderated by Pigliucci. Eventually the small room filled up with seventy-five or eighty conference attendees, most all seemingly vociferous skeptics, with Nelson, the lone ID proponent among them, genially maintaining that science should be open to the possibility that naturalism just might not have all the answers and that science should be open to other hypotheses (design). Nelson, who has a Ph.D. from the University of Chicago in philosophy, generally spoke from a philosophical not a scientific viewpoint, in maintaining that design, not evolution, just might have played a role in shaping the world. At one point, an audience member praised him for his courage in coming into the wolf's den to take part in the informal session. He indicated he enjoyed the interplay. The audience, although clearly unconvinced by his arguments, appeared to as well.

—*K.F.*

Fringe Psychotherapies

Fringe psychotherapies was the topic of one session moderated by Scott Lilienfeld of Emory University. Lilienfeld spoke about the proliferation of fringe psychotherapies, and claimed that there are over 500 such untested techniques currently in use. Far from being a case of a few bad apples, Lilienfeld said that surveys suggest that the majority of practitioners do not use empirically supported methods with their patients.

Dr. Gina Green gave an overview of the pseudosciences surrounding autism, a disease that usually strikes the young and leaves them mute, with impaired mental and motor skills. Because the cause(s) of autism are still unclear, there is a lot of mystery and magical thinking associated with the disease. The unproven, discredited beliefs and techniques include Facilitated Communication, the hormone secretin, and the belief that vaccines somehow cause the condition. Green said that the problem isn't as bad as it used to be, due in part to skeptical exposés, greater public awareness, and recent court decisions.

Steven Jay Lynn, of the State University of New York, discussed recovered memories and pointed out that "even under the best of circumstances memory is fallible." Though the heyday of recovered memories has passed, many therapists still use recovered memories and believe them to be an important part of treatment. Carol Tavris also gave a talk, discussing the pathologizing of everyday problems and the danger to patients of unregulated therapists. New, unproven (and frequently outlandish) therapies pop up with alarming regularity, threatening patients unaware of the shaky foundations of such treatments. Those needing help, she said, need to be wary of people who read about (or take a seminar on) some new, unproven technique and anoint themselves therapists.

During the question and answer session, one woman complained that most of the topics covered were old news, and that the panelists were "beating a dead horse." Lilienfeld noted that though some treatments have been discredited, other unproven therapies are unfortunately alive and well: "The horse is not dead yet."

Urban Legends

The session on urban legends featured author and folklorist Jan Brunvand, Barbara and David Mikkelson (co-creators of the urban legends Web site snopes.com), and Tim Tangherlini of the University of California at Los Angeles.

Brunvand discussed the popularization of urban legends and surveyed the different ways in which they have been commercialized, from teen slasher movies to advertisements. Urban legends have turned from a folklore topic to marketed, prepackaged entertainment.

The Mikkelsons focused on the rumors and urban legends surrounding the September 11, 2001, attacks. Such stories included the tale about a Bible that miraculously remained unburned in the fiery Pentagon attack (it was in fact a dictionary); that dead airplane passengers, still strapped in their seats, were found in apartments adjacent to the World Trade Center; and various rumors that Nostradamus had predicted the attacks.

Tim Tangherlini approached the topic from a different angle, examining the role of the mediator in reports and legends dealing with monsters, aliens, or other "outsiders." For example, one element that both urban legends and accounts of aliens or monsters have in common is that they are almost always told not by the person who supposedly actually experienced it, but by a mediator, someone telling the audience the story.

Though not as well attended as some of the earlier sessions (partly because it was the last), the session titled "Paranormal Around the World" was an important forum for international skeptics. Speakers came from China, Germany, Holland, Australia, Peru, Russia, Argentina, Venezuela, and India to discuss the paranormal and skeptical movements in their native lands. Sami Rosenbaum, a skeptic from Venezuela, spoke of the prestige that his conference attendance would bring to the skeptics movement in his part of South America. Already, he said, interviews were being lined up for him back in the capital city of Caracas. All the speakers discussed the need for more skepticism in their countries, and most credited CSICOP as important in helping get the local groups started. Across varied skin tones and accents, the unifying message came through that critical thinking and science are important in all societies.

A few grumblings were heard, mostly about the sporadic technical difficulties and the tightly-packed schedule that allowed little time to meet with other skeptics. On the whole, however, the conference was a great success, and Los Angeles proved to be a good place for media outreach and communicating the skeptical message to the world.

—*B.R.*

Kendrick Frazier is Editor, and Benjamin Radford is Managing Editor, of the SKEPTICAL INQUIRER.

'Miraculous' Image of Guadalupe Painted

JOE NICKELL

Mexico City's Image of Guadalupe—a sixteenth-century portrait of the Virgin Mary supposedly imprinted miraculously on an Aztec convert's cloak—has been confirmed as merely a painting. Nevertheless Pope John Paul II is scheduled to confer sainthood on the Aztec, Juan Diego, despite the pleas of some Catholic scholars. These include the former curator of the Basilica of Guadalupe, who doubts the historical existence of Juan Diego and said such a canonization would be "recognition of a cult."

Now a ubiquitous symbol of Mexican Catholicism, the image, say critics, was painted by a native artist named Marcos Cipac de Aquino. It was probably utilized by Spanish conquerors to convert the Indians to Catholicism. (A church to enshrine the image was built in front of a site where the Aztecs had had a temple for their virgin goddess Tonantzin, thus grafting the Catholic tradition onto the Indian one—a process folklorists call syncretism.)

Gerald Fried

Recently, the results of a secret 1982 scientific study of the image were reported by the Spanish-language magazine *Proceso* (in its May 12 and 19, 2002 issues). Art restoration expert José Sol Rosales examined the cloth with a stereomicroscope and determined it did not originate supernaturally but was instead the work of an artist who used the materials and methods of the sixteenth century.

According to Rosales, the canvas appeared to be a mixture of linen and hemp or cactus fiber. It was prepared with a brush coat of white primer (calcium sulfate), and the painting was then rendered in distemper (i.e., paint consisting of pigment, water, and a binding medium). The artist used a "very limited palette," stated the expert, consisting of black (from pine soot), white, blue, green, various earth colors ("tierras"), reds (including carmine), and gold.

Rosales's report confirms and amplifies what skeptics had determined from early records, infrared photographs, and other evidence. (See Joe Nickell and John F. Fischer, "The Image of Guadalupe: A Folkloristic and Iconographic Investigation," SKEPTICAL INQUIRER 9:3 [Spring 1985], 243–255.)

In addition, new scholarship suggests that, while the image was painted not long after the Spanish conquest and was said to have miraculous powers, the pious legend of Mary's appearance to Juan Diego may date from the following century.

Meanwhile, none of this appears to have had any effect on the Vatican, which seems set to make a saint of "Juan Diego," fictitious or not.

Joe Nickell is CSICOP's Senior Research Fellow and columnist for the SKEPTICAL BRIEFS.

'ESP Test' Fools UK's *Daily Mirror*

Prophecy and clairvoyance are so widely believed by millions of people that magicians are credited with psychic powers that not even Nostradamus would dare claim. In fact, a lot of "ESP magic tricks," "mind-reading tricks," or

"mental magic" is as much trickery as pulling a rabbit out of a hat.

At my Web site www.pickover.com I promoted an "ESP Test" that is nothing more than an old-fashioned card trick. Viewers concentrate on an image of a card, and, for the grand finale, the computer appears to correctly "guess" their card. Give it a try. Do you see the trick? In order to distract test subjects, my ESP page has all sorts of distracting graphics, along with the enigmatic words "quantum consistency" followed by a random number.

I'm not the first person on the Web to try simple tricks of this sort, but I may be the first to catalog all of the amazing incorrect suggestions for how the trick worked. Here are just a sampling of explanations, excerpted so as to reduce space and to give you a feel for the range of explanations and theoretical musings.

- "The ESP experiment is awesome. I even tried thinking of one card, while quietly having selected another. Both disappeared! I have been interested in this phenomenon since 1968, when I

corresponded with parapsychologist Dr. Joseph Banks Rhine at Duke University. Your results are significant and don't deteriorate over time. Emotional excitation does not even seem to interfere, as would be expected if one looks at Sufi literature. Therefore, there is a logical, non-paranormal quantum effect going on."

- "I viewed the computer source code and could not discover mathematical computations that would aid the Web page in making a decision. Perhaps the computer scans eye movement and detects pupil dilation resulting from concentration."
- "Your ESP mechanism correctly determine the playing card I selected. Knowing that you have written a book on time travel, I suspect you have discovered a limited (but real) mechanism of modifying past events."
- "I am quite impressed, Mr. Pickover. I generated random numbers using the Time of Day clock on my computer, and found the remainder when divided by 3 for the first number; took out the first business card that came to hand and took the first phone number on there modulo 6, and then located a calculator and had it generate a pseudo-random number which I then did modulo 6. I did the little experiment three times, and your program 'got' it all times. I would like to study the Java computer code for the Web page to learn more."
- "I am from the University of Lapland, Finland. Your program removed several times the card I named, even though I spoke Finnish when naming the card. There are not many people in the Anglo-Saxon world who can read a Finno-Ugric mind that easily (or know any Finnish)."
- "Just another note to tell you how disturbed I am with the program's ability to determine my selection infallibly. I would like to be able to rule out subliminal flashes or influence due to the long distance phone choices and that as far as I know, subliminal effects are extremely lessened when the subject is aware that these are in operation. Are you able to detect the mysterious 'visual rays' that are theorized to exist in the fringe sciences?"

You can read dozens of additional explanations at my Web site and in my book *Dreaming the Future* (Prometheus). This ESP Test has recently taken the world by storm. On June 5, 2002, the popular UK newspaper the *Daily Mirror* reported on my Web site:

> It's got to be one of the weirdest sites we've ever come across but it's definitely worth visiting. Pop into http://sprott.physics.wisc.edu/pickover/esp.html and you'll be baffled for days—even months. We don't know how he does it but Cliff Pickover, the site's creator, claims he's conducting an ESP test. Click on one of three eyes, he asks, and then look at six playing cards. Without moving your cursor, pick a card, shout out its name and then click on one of six more eyes. It then tells you which card you chose. It claims to be correct 98 per cent of the time but won't tell you how. Every one of the 60 times we tried—and we did everything we could to trick them—they got it right. Spooky!

My goal in conducting this little demonstration was to emphasize how easily we can be fooled and how great our will is to believe in the spiritual, the paranormal, and phenomena beyond science. I do believe that our universe is a mysterious place, but I hope this simple test reinforces the need for skeptical thinking when evaluating claims of the paranormal. We certainly need rigorous controls in parapsychological research and better public understanding of the difference between good and bad science. Martin Gardner in his book *Science: Good, Bad and Bogus* emphasizes the need for better evidence supporting research claims in such areas as precognition, biorhythms, ESP, psychokinesis, faith healing, and psychic surgery. Given the proliferation of United States patents now being issued for inventions that rely on pseudoscience and unproven divination methods with life-threatening consequences, increased diligence becomes of utmost importance.

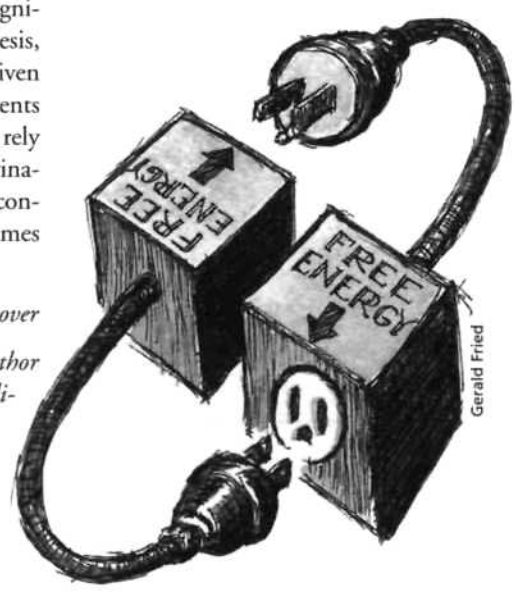
—Clifford A. Pickover

Clifford A. Pickover, Ph.D., is the author of thirty books on science, art, and religion. His latest book is Liquid Earth, *a science-fiction novel that explores the melting of reality along a rustic Main Street in Shrub Oak, New York.*

APS Statement Knocks Perpetual Motion, 'Free Energy' Claims

Robert L. Park's weekly electronic newsletter "What's New" (American Physical Society, Washington, D.C., and University of Maryland) of June 28, 2002, had this item:

> FREE ENERGY: APS BOARD SPEAKS OUT ON PERPETUAL MOTION.
>
> Well, it's not exactly the frontier of physics research, but somebody had to say it. Already this year we've had the Jasker Power System ("What's New" 25 Jan 02), Chukanov Quantum Energy (WN 8 Feb 02), and the Motionless Electromagnetic Generator (WN 5 Apr 02). Not to mention Bubble Fusion (WN 1 Mar 02), hydrino rockets (WN 21 Jun 02), and whatever scam Dennis Lee is running now (WN 3 May 02). So, on Saturday, June 22, the Executive Board of the American Physical Society unanimously adopted the following statement: "The Executive Board of the American Physical Society is concerned that in this period of unprecedented scientific advance, misguided or fraudulent claims of perpetual motion machines and other sources of unlimited free energy are proliferating. Such devices would directly violate the most fundamental laws of Nature, laws that have guided the scientific advances that are transforming our world."



Gerald Fried

This item is from the May 3, 2002, "What's New":

> FREE ENERGY: PERPETUAL-MOTION HUCKSTER INDICTED IN KENTUCKY.
>
> Last Friday, Dennis Lee and his various screwball companies were barred from conducting business in Kentucky (WN 7 Sep 01). By Monday, a grand jury had indicted Lee on consumer-fraud charges. Each of the multiple felony counts could net him five to ten in the can. Other states are said to be lining up to file their own charges. Lee takes an old fashioned approach to free-energy scams, resurrecting failed perpetual-motion ideas from a bygone era, that still have the power to bamboozle the scientifically unsophisticated. He doesn't shy away from the term "perpetual motion," and doesn't bother with applying for patents. What he sells are dealerships. Delivery is just around the corner.

Robert L. Park is director of the Washington office of the American Physical Society, a physics professor at the University of Maryland, and author of Voodoo Science.

Geoarchaeology: Ancients Right about Delphi Earth Gases

Greek historians wrote of an oracle at Delphi who provided cryptic consultation to pilgrims plagued with questions. For about twelve centuries Delphic women chosen for this job delivered the advice of the gods, from family matters to choosing sides during times of war. During the late Bronze Age, around 1200 B.C., they translated for the earth goddess, Gaia, and later in the eighth century B.C. spoke as Apollo's vocal instrument when this god took over the sanctuary.

The oracle sat on a three-legged stool in the interior recesses of the temple, calmly delivering her prose while inhaling the breath of the gods. This breath, or pneuma, emanated from fissures in a floor left naked to the earth, according to classical accounts. Springs bubbling to the surface, they said carried sweet-smelling fumes. Some days and months were better for prophecy than others. The oracle spoke specifically on the seventh day after each new moon, but not at all in winter. If the temple's visitor demanded a forced performance at the wrong time, the oracle might run wild and frantic around the room delivering her prophecy in a frenzy.

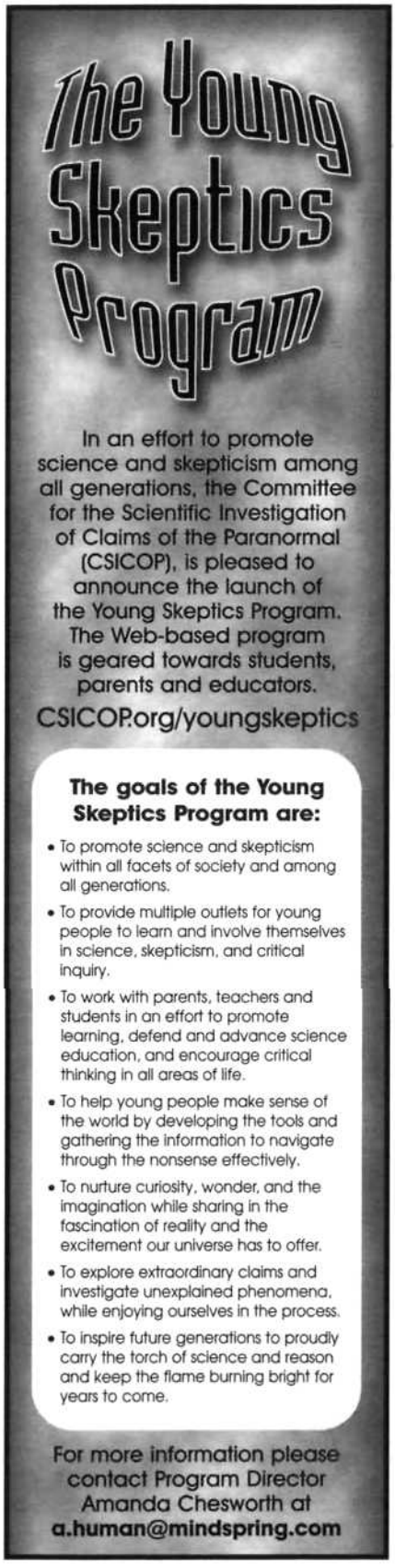
Throughout this time, the sacred site remained in a unique geological location. According to a team of four researchers led by geologist Jelle de Boer of Wesleyan University in Middletown, Connecticut, the temple was built over the intersection of two faults: one young and active and the other old and probably inactive. Since 1996, de Boer and colleagues in the fields of archaeology, chemistry and toxicology have been exploring the implications of these faults. Embedded in oily limestone, the faults vented hydrocarbon vapors through fissures in the bedrock and continue to bubble forth ethylene, ethane, and methane in neighboring springs today.

"All three hydrocarbon gases have the potential to produce an altered mental state," says Henry Spiller of the Poison Center at Kosair Children's Hospital in Louisville, Kentucky, who published a paper on the toxic aspects of these gases in the April 2002 issue of *Clinical Toxicology*. Ethylene in particular would have the strongest effect and is often described as a sweet-smelling gas. "The onset of the effects from ethylene are nearly immediate. The dose needed for an awake euphoric feeling are significantly less than that needed for deep operable anesthesia," Spiller says. During the first human experiments with ethylene as an anesthetic gas in 1923, most subjects had a very pleasant experience. However two people in the twelve studied had periods of excitement, confusion, and combative behavior, similar to a frantic oracle on a bad day.

The philosophers in the first century wrote of gases producing euphoria and of a spring emanating from fissures, or chasms, in the bedrock inside the oracular chamber. But a dichotomy arose in the twentieth century between ancient and modern interpretations for the geological source of the oracle's inspiration. In 1892 and following years, French archaeologists including Pierre Amandry excavated the temple ruins and were disappointed to find fissures and water, but not the opening of a chasm. In 1904 a visiting English scholar, A. P. Oppé, deemed the ancients were perpetuating a myth—or worse a blatant lie. He stated that Delphi did not sit on volcanic land and therefore the bedrock never emitted gases. Amandry in 1950 published a book also declaring the area volcano- and vapor-free. Over the decades the original French finding of water and fissures was forgotten and the Greek interpretations ignored. In their place came a standing assumption that the ancients were wrong.

Geological features beyond the immediate temple site provided more modern explanations on how the myth got started. The sanctuary of Apollo sits at the base of Mount Parnassus, where

Gerald Fried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In an effort to promote science and skepticism among all generations, the Committee for the Scientific Investigation of Claims of the Paranormal (CSICOP), is pleased to announce the launch of the Young Skeptics Program. The Web-based program is geared towards students, parents and educators.
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• To provide multiple outlets for young people to learn and involve themselves in science, skepticism, and critical inquiry.
• To work with parents, teachers and students in an effort to promote learning, defend and advance science education, and encourage critical thinking in all areas of life.
• To help young people make sense of the world by developing the tools and gathering the information to navigate through the nonsense effectively.
• To nurture curiosity, wonder, and the imagination while sharing in the fascination of reality and the excitement our universe has to offer.
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faults crisscross the region like wrinkles in the palm of an aged hand. Motion along the Delphi fault, which strikes east-west under the sanctuary, is thought to have caused the destruction of Apollo's older temple in 373 B.C. But ruins and landslide deposits obscure the exact site where the fault runs below the temple. Questions arose concerning the role of this fault in the rise of the mysterious vapors.

Archaeologist John Hale of the University of Louisville in Kentucky took some cajoling from de Boer to begin what would become a five-year expedition to determine the veracity of the ancient accounts. Over a bottle of Dão, a Portuguese red wine, the two made a bet. "Jelle de Boer caught my interest with his description of exposed fault planes that he had seen on the slope of Mount Parnassus east and west of the oracle site, and with his assumption that this fault represented the chasm in the earth that ancient authors linked to the Delphic oracle," Hale says. "It took a bet or a challenge to start this project because for almost a century it has been an article of faith among archaeologists, historians, and classicists that the ancient traditions about the Delphic oracle were all wrong. I was very reluctant to admit that a geologist might be able to prove that it was modern scholarship that was wrong, and the ancient authors were right."

Last year in the August issue of *Geology*, de Boer and his team reported the discovery of a second fault they called Kerna, after a spring northwest of Apollo's temple, and the gaseous findings of the spring. The Kerna and Delphi fault zones contain numerous extensional fissures, de Boer says.

"Where the faults intersect the bedrock is especially permeable." With regard to the absence of volcanic fumes, de Boer says: "Fractures all over the world emit gases. Here in New England, for instance, radon surfaces along faults in many areas. Along the fractures in Delphi, warm groundwater significantly enriched in calcium has emerged for ages." The springs left deposits of travertine below the temple and among the ruins. Geochemist Jeffrey Chanton of Florida State University found methane and ethane still trapped in the travertine. The ethylene, a less stable molecule, he found still emerging from Kerna spring, but not in a spring 100 meters to the east of the temple. "This finding suggests that the sites of hydrocarbon emissions at Delphi vary in output and are rather localized," the authors say.

Delphi is not the only Greek site where hydrocarbon gases emerge. On the island of Zakynthos to the west, where gas springs and tar pits are tourist attractions, Chanton found spring water with ethylene levels similar to those in Delphi.

Now de Boer and his team have opened the flood gates for further research to investigate the truth of the ancient accounts. "It is interesting to note that the Delphi oracle never held sessions during the winter months, when the god Apollo was believed to have gone north to the land of the Hyperboreans," de Boer says. "This suggests that the gas emissions at Delphi may have diminished during the colder periods."

Geologist George Davis of the University of Arizona runs a seminar that integrates geology and archaeology. In January, Hale was one of his guest lecturers. "I'm confident if someone would go with Hale to that site, they would be convinced that at least one fault passes right through the site and that gases have been measured coming out of the fault zone that would have affected people, including the oracle, in the enclosed chamber above the fault," Davis says. "More interpretive challenges of what may have happened still exist, but overall their story holds together."

—Christina Reed

Christina Reed is associate editor of Geotimes. *Reprinted with permission from* Geotimes, *May 2002. Copyright the American Geological Institute.* □

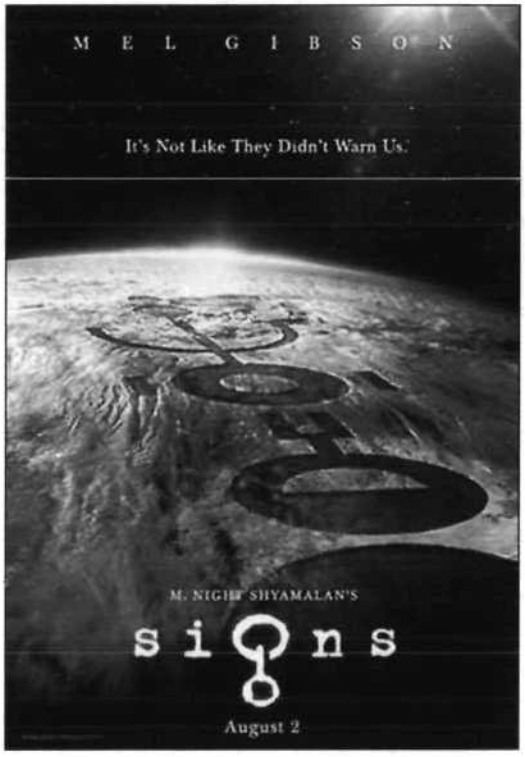
Circular Reasoning:
The 'Mystery' of Crop Circles and Their 'Orbs' of Light

JOE NICKELL

Since they began to capture media attention in the mid 1970s, and to proliferate and evolve through the decades of the 1980s and 1990s, crop circles have provided mystery and controversy. New books, touting "scientific research," continue the trend. The topic is also getting a boost from a new Hollywood movie, *Signs*, starring Mel Gibson as a Pennsylvania farmer who discovers a 500-foot design imprinted in his crops and seeks to learn its meaning.

At issue are swirled, often circular designs pressed into crop fields, especially those of southern England. They can range from small circles only a few feet in diameter to elaborate "pictograms," some now as large as a few hundred feet across. By the end of the 1980s books on the crop circle phenomenon had begun to spring up as well, and soon circles-mystery enthusiasts were being dubbed *cereologists* (after Ceres, the Roman goddess of vegetation). Circlemania was in full bloom (Delgado and Andrews 1989; Nickell and Fischer 1992; Schnabel 1994).

Most cereologists—a.k.a. "croppies" (Hoggart and Hutchinson 1995)—believed the circular designs were being produced either by extraterrestrials or by hypothesized "plasma vortices," supposedly "small, local whirlwinds of ionized air" (Haselhoff 2001, 5–6). A few took a more mystical approach. When I visited the vast wheat crops of the picturesque Wiltshire countryside in 1994, at one formation a local dowser told me he believed the swirled patterns were produced by spirits of the earth (Nickell 1995).



Hoaxers, most croppies insisted, could not be responsible because the plants were only bent and not broken, and there were no footprints or other traces of human activity. Skeptics replied that from mid-May to early August the English wheat was green and pliable, and could only be broken with difficulty. As to the absence of tracks, they were precluded by *de facto* footpaths in the form of the tractor "tramlines" that mark the fields in closely spaced, parallel rows (Nickell and Fischer 1992).

Investigation into the circles mystery indicated that it might be profitable to look not just at individual formations but at the overall phenomenon (rather on the old principle that one may fail to see the forest for the trees). Forensic analyst John F. Fischer and I soon identified several characteristics that suggested the work of hoaxers (Nickell and Fischer 1992):

1. *An Escalation in Frequency.* Although there were sporadic reports of simple circles in earlier times and in various countries (possibly as UFO-landing-spot hoaxes), the classic crop circles began to be reported by the mid 1970s. Data on the circles showed that their number increased annually from 1981–1987, an escalation that seemed to correlate with media coverage of the phenomenon. In fact it appeared that the coverage helped prompt further hoaxes.

2. *Geographic Distribution.* The phenomenon showed a decided predilection

Joe Nickell has written about crop circles in his book Real-life X-Files *(2001).*

for a limited geographic area, flourishing in southern England—in Hampshire, Wiltshire, and nearby counties. It was there that the circles effect captured the world's attention. And, just as the number of circles increased, so their locations spread. After newspaper and television reports on the phenomenon began to increase in the latter 1980s, the formations began to crop up (so to speak) in significant numbers around the world. Indeed the circles effect appeared to be a media-borne "virus."

3. *Increase in Complexity.* A very important characteristic of the patterned-crops phenomenon was the tendency of the configurations to become increasingly elaborate over time. They progressed from simple swirled circles to circles with rings and satellites, to still more complex patterns. In 1987 came a crop message, "WEARENOTALONE" (although skeptics observed that, if the source were indeed English-speaking extraterrestrials, the message should have read "You" rather than "We"). In 1990 came still more complex patterns, dubbed "pictograms." There were also free-form shapes (e.g., a "tadpole"-like design), a witty crop *triangle*, and the hilarious *bicycle* (see Hoggart and Hutchinson 1995, 59).

There also appeared beautifully interlinked spirals, a Menorah, intricate "snowflake" and stylized "spider web" designs, elaborate "Torus Knot" and "Mandala" emblems, pentagram and floral patterns, and other distinctive formations, including an "Origami Hexagram" and several fractals (mathematical designs with a motif subjected to repeated subdivision)—all consistent with the intelligence of modern *homo sapiens*. At the end of the decade came many designs that included decidedly square and rectilinear shapes, seeming to represent a wry response to the hypothesized swirling "vortex" mechanism.

4. *The Shyness Factor.* A fourth characteristic of the cropfield phenomenon is its avoidance of being observed in action. It is largely nocturnal, and the designs even appear to specifically resist being seen, as shown by Operation White Crow. That was an eight-night vigil maintained by about sixty cereologists in June 1989. Not only did no circles appear in the field chosen for surveillance but—although there had already been almost a hundred formations that summer, with yet another 170 or so to occur—*not a single circle was reported during the period anywhere in England.* Then a large circle-and-ring formation was discovered about 500 yards away *on the very next day!*

These and other characteristics are entirely consistent with the work of hoaxers. Indeed, as John Fischer and I were about to go to press with our investigative report, in September 1991 two "jovial con men in their sixties" confessed they had been responsible for many of the crop formations made over the years. In support of their claim the men, Doug Bower and Dave Chorley, fooled cereologist Pat Delgado. He declared a pattern they had produced for a tabloid to be authentic, insisting it was of a type no hoaxer could have made. The pair utilized a rope-and-plank device to flatten the plants, demonstrating their technique for television crews, e.g., on ABC-TV's *Good Morning America* on September 10, 1991 (Nickell and Fischer 1992, 145–148).

Cereologists were forced to concede that hoaxers were producing elaborate designs and that "there are many ways to make a hoaxed crop circle" (Haselhoff 2001, 34). (For example, some who go 'round in circles use a garden roller to flatten the plants [Hoggart and Hutchinson 1995].) While in the past some cereologists thought they could distinguish "real" from fake circles by dowsing (Nickell 1995), the more cautious now admit it is not an easy matter, "certainly not as long as we do not even know exactly what mechanism creates crop circles" (Haselhoff 2001, 34).

Cereologists were forced to concede that hoaxers were producing elaborate designs and that "there are many ways to make a hoaxed crop circle."

Nevertheless the croppies were sure that some of the formations must be genuine, citing various "unexplained" features. More recently they invoked new "scientific" evidence in that regard, such as that provided by "the BLT Research Team" in Cambridge, Massachusetts. The "B" and "T" are circle "researchers" and "L" is a semi-retired biophysicist, W. C. Levengood. He finds a correlation between certain deformities in plants and their locations within crop-circle-type formations, but not control plants outside them (Levengood and Talbott 1999). However, correlation is not causation, and there are other objections to his work (Nickell 1996a). As well, more mundane hypotheses for the effects—for instance, compressed *moist* plants steaming in the hot sun—appear to have been insufficiently considered.

Crucially, since there is no satisfactory evidence that a single "genuine" (i.e., "vortex"-produced) crop circle exists, Levengood's reasoning is circular: although there are no guaranteed genuine formations on which to conduct research, the research supposedly proves the genuineness of the formations. But if the work were really valid, Levengood would be expected to find that a high percentage of the crop circles chosen for research were actually hoaxed, especially since even many ardent cereologists

admit there are more hoaxed than "genuine" ones (Nickell 1996a; Nickell and Fischer 1992). For example, prominent cereologist Colin Andrews (2001) has conceded that 80 percent of the British crop circles are manmade; yet Levengood claims his research "suggests that over 95 percent of worldwide crop formations involve organized ion plasma vortices . . ." (Levengood and Talbott 1999).

Levengood and others who postulate crop-stamping, ion plasma vortices have to face the fact that those remain unrecognized by science. They owe their imagined existence to George Terence Meaden, a former professor of physics who took up meteorology as an avocation. His book *The Circles Effect and Its Mysteries* (1989) is still revered by many cereologists. Alas, however, he merely attempted to "explain" a mystery by creating another, and—humiliated by hoaxers—eventually retired from the scene, *conceding that all of the complex designs were fakes* (Hoggart and Hutchinson 1995, 59).

Nevertheless, many circles aficionados have begun to photograph supposed vortex effects which, curiously, resemble some of the same photographic anomalies that are the stock-in-trade of ghost hunters. For example, in her *Mysterious Lights and Crop Circles,* credulous journalist Linda Moulton Howe (2000, 137, 255) exhibits a flash photo taken in a crop circle that shows a bright "mysterious arch with internal structure that seems to spiral like a plasma." Unfortunately for Howe (erstwhile promoter of cattle mutilations and similar "mysteries"), the effect is indistinguishable from that caused by the camera's unsecured wrist strap reflecting the flash (Nickell 1996b). As corroborative evidence of this mundane cause, the bright strand-like shapes typically go unseen by the ghosthunter or cereologist, only appearing in their snapshots.

Again, Howe (2000, 169–176) shows several photos containing "transparent spheres" that the croppies call "energy balls," "light orbs," "atmospheric plasmas," etc. They are indistinguishable from "orbs" of "spirit energy" typically seen in photographs of graveyards and other "haunted" places and that sometimes appear in snapshots as UFOs. Skeptics have demonstrated that these globelike effects can be produced by particles of dust, water droplets, and the like reflecting the flash (Mosbleck 1988; Nickell 1994; Burton 1999). Other simulators of paranormal "energy" in photos include lens flares (the result of interreflection between lens surfaces), bugs and debris reflecting the flash, and many other causes, including film defects and hoaxes (Nickell 1994).

Sometimes, however, "hovering balls of light" and other "energy" effects are reported by eyewitnesses, though not only in the vicinity of crop circles (Haselhoff 2001; Howe 2000). These too may have a variety of causes including pranksters' parachute flares ("Flares" 1999), various misperceived aerial craft and other phenomena (such as ball lightning), false claims, hallucinations, etc. In some instances, small lights observed moving about cropfields at night might have come from the flashlights of the circle makers!

It appears that for the foreseeable future the crop-circle phenomenon will continue. At least it has moved from the level of mere hoaxing—"a form of graffiti on the blank wall of southern England" (Johnson 1991)—to represent an impressive genre of outdoor art. The often breathtaking designs (best seen in aerial photographs, like the giant Nazca drawings in Perú) are appreciated not only by the mystery mongers but by skeptics as well. Indeed as reliably reported (Hoggart and Hutchinson 1995), skeptics have helped to make many of them!

The crop-circle phenomenon will continue. At least it has moved from the level of mere hoaxing to represent an impressive genre of outdoor art.

Acknowledgments

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Winchester Mystery House: Fact vs. Fancy

It is the work of an eccentric widow, supposedly guided by spirits, and a construction project that lasted thirty-eight years. It began in 1884 with an existing but unfinished eight-room farmhouse near San Jose, California, and culminated in a seven-story, turreted, Gothic Victorian mansion that once contained an estimated 500 rooms. The 1906 San Francisco earthquake significantly reduced the stacked and sprawling architectural wonder, but when Sarah Winchester died in 1922 it still "contained 160 rooms, 2,000 doors, 10,000 windows, 47 stairways, 47 fireplaces, 13 bathrooms, and 6 kitchens" (*Winchester* 1997).

Even more remarkable, the round-the-clock construction yielded "an interminable labyrinth" of "miles of twisting hallways" (*Winchester* 1997, 14). Indeed it became "an architectural nightmare," featuring rooms with odd angles, stairways leading to nowhere, secret passageways, doors and windows opening onto blank walls, and railing posts set upside down (Guiley 2000; Murray 1998).

Fascinating in its own right, Sarah Winchester's remarkable story has been embellished—rather like her strange mansion itself—with implausible incidents, ornate details, and "facts" that lead, tortuously, to dead ends. The truth is elusive because she was never interviewed and left no diary or other written record. Moreover, "wild stories" about her proliferated in her lifetime as well as after her death, and popular writers garbled—and invented—details to suit their purposes (*Winchester* 1997, 11).

Figure 1. View of Winchester Mystery House, with author standing in front, fails to convey the immensity of the mansion.

In an attempt to sort truth from fiction, I toured Winchester Mystery House (accompanied by Vaughn Rees of the Center for Inquiry–West) on October 24, 2001, as part of a California speaking and investigations tour. Subsequently I delved into many of the books and other sources of lore and legend about Sarah Winchester and her curious obsession. Here is some of what I found.

• **Fancy:** The story begins in 1862 in New Haven, Connecticut, with Sarah L. Pardee's marriage to William Wirt Winchester. He was the son and heir of Oliver Fisher Winchester whose repeating firearm became famous as "The Gun That Won the West" (*Winchester* 1997, 46). However, according to one tale, "During a Connecticut thunder storm, Mrs. Winchester's husband and baby lost their lives in a tragic fire" (quoted in Rambo 1967, 6). But wait: Another source (Smith 1967) states, "When tragedy struck this woman, it pulled no punches. Her husband died a lingering death from tuberculosis, and her little girl passed away almost immediately afterward." Again, in his *The National Directory of Haunted Places*, Hauck (1996) separates the deaths with a bit more time, stating that "her husband and only child died within months of each other."

Fact: Actually, the Winchesters' infant daughter Annie died first, in 1866, and it was not until *fifteen years later*, in 1881, that Sarah's husband passed away (*Winchester* 1997, 8).

• **Fancy:** Mrs. Winchester, grief-stricken but having inherited her husband's fortune, sought out a Boston medium to contact his spirit. The medium, Adam Coons, relayed the message, somehow rediscovered by Susy Smith (1967): "This is a warning. You will be haunted forever by the ghosts of

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those who have been killed by Winchester rifles, unless you make amends to them." She was instructed to head west, guided by her husband's spirit.

However, another source states it was not a male medium but "a seeress" who provided Mrs. Winchester with the message (again, somehow rediscovered), "There is a curse on your life. It is the same curse that took your child and husband . . . that has resulted from the terrible weapon that the Winchester family created. . . . [B]uild a house not only for yourself but also for the spirits of those who have fallen before that terrible weapon. As long as you build, you will live. Stop and you will die" (Winer and Osborn 1979).

Fact: Whether the "Boston medium" was a man or woman—or whether Sarah Winchester ever consulted such—has not been proved. One local historical writer maintains that after her husband's death, Mrs. Winchester was indeed grief-stricken. "Doctors and friends urged her to leave the East, seek a milder climate and search for some all consuming hobby. One physician *did* suggest that she 'build a house and don't employ an architect.'" That researcher concedes, "Perhaps she *was* a spiritualist," but insists, "Miss Henrietta Severs, her constant companion for years, always firmly denied she had any Spiritualist leanings" (Rambo 1967, 8).

• **Fancy:** Sarah Winchester's "curious building techniques" resulted from her desire "to control the evil entities and keep them from harming her." For example, "One stairway, constructed like a maze, has seven flights and requires forty-four steps to go ten feet" (Smith 1967, 38). Some interior rooms have barred windows, a floor is comprised of trap doors, and there are doors and stairs that lead nowhere (Rambo 1967; Murray 1998, 59).

Fact: The winding stair with two-inch steps had nothing to do with ghosts and everything to do with Mrs. Winchester's severe arthritis and neuritis. The low steps were built to accommodate her diminished abilities (just as elevators were later installed when she was forced to use a wheelchair). The curiously barred interior windows have a simple explanation: they were once *exterior* windows, but the constant additions to the house relegated them to the inside. The doors and stairs that lead to dead ends are similarly explained. As to the floor with trap doors, those are in a special greenhouse room; they were designed to open onto a zinc subfloor so that runoff from watered plants could be drained by pipes to the garden beneath (Rambo 1967; *Winchester* 1997; Palomo 2001).

The curiously barred interior windows have a simple explanation: they were once exterior windows, but the constant additions to the house relegated them to the inside.

Figure 2. View from a window shows part of the sprawling grounds, including the bell tower that, allegedly, was once used to summon spirits.

• **Fancy:** Sarah Winchester's blue séance room, her "secret rendezvous with the spirits," was off limits to her huge staff of carpenters and servants. There, at midnight—while a bell in a tower was rung to summon spirits—she donned one of thirteen ceremonial robes she wore when communing with the entities. She also held parties for the spirits, offering them caviar, stuffed pheasant, and other dishes served on gold plates which she otherwise kept in her safe. Sometimes, late at night, "ghostly music" was heard "wafting from the dark mansion" (*Winchester* 1997; Rambo 1967; Winer and Osborn 1979).

Fact: According to historical writer Ralph Rambo (1967, 8–9), whose father had helped with the ground's landscaping, the allegedly sacrosanct "séance" room "was also utilized as a bedroom at various times by her foreman, the chauffeur, the head Japanese gardener and his wife." As well, the bell was used, not for midnight spirit assembly, but as a call to and from work and as an alarm in case of fire. There is no evidence Mrs. Winchester had thirteen ceremonial robes; that fiction was probably inferred from the total of thirteen hooks in the room's two closets, some of them, however, placed implausibly low for robes. When after her death her safe was opened, there was no solid-gold dinner service, only mementos including a lock of her baby's hair. Acknowledging the "legend" of the plates supposedly used to serve phantom guests exotic dishes, a Winchester Mystery House publication (*Winchester* 1997) states: "On the other hand, this theory might have come from rumors about the mansion's well-fed servants!" The "ghostly music" has an even simpler explanation: often when she was unable to sleep, Mrs. Winchester played the pump organ in the Grand Ballroom.

• **Fancy:** Mrs. Winchester was so reclusive that she always wore a black veil. She also refused admission to most visitors, including Mary Baker Eddy, the founder of Christian Science. President

Theodore Roosevelt, a fan of Winchester rifles, knocked at the front door but was unrecognized by a servant and turned away (or insulted by being sent around to the back of the house) (*Winchester* 1997; Rambo 1967). However, "One of her few guests was Harry Houdini, who never spoke of his single visit to Winchester House" (Houck 1996).

Fact: Although Mrs. Winchester was reclusive, the single existing photograph taken of her during the thirty-eight years of mansion construction shows her seated in her carriage, apparently gazing at the camera, but without veil (*Winchester* 1997, 6). There are various versions of the Teddy Roosevelt story, but Ralph Rambo (1976, 9)—who was "standing directly across the road that day"—says the President was driven past the house; the local Chamber of Commerce had asked permission for Mr. Roosevelt to visit but received Mrs. Winchester's sharp "No!" Whether Mary Baker Eddy gained entrance or not is uncertain (Hauck 1996; Smith 1967, 40; Rambo 1967). However, Houdini *did* visit the house and *was* admitted—even joining in a midnight séance!—but this took place in November 1924, two years after Sarah Winchester's death. Houdini discussed his visit in an article in Portland's *The Oregon Daily Journal* (*Winchester* 1997, 42).

• **Fancy:** In the early years of her residence, Mrs. Winchester planned a lavish reception for Santa Clara Valley residents, sending out hundreds of gilded engravings. She had servants prepare "a sumptuous midnight banquet" and hired "a famous orchestra" for entertainment, but not a single guest appeared. In 1906 the Great San Francisco Bay Area earthquake toppled the seven-story tower onto Mrs. Winchester's bedroom where she was trapped for several hours, bemoaning, "Oh, God help me. The evil spirits have taken over the house." After servants rescued her, the terrified widow fled to Redwood City and did not return for six years (Rambo 1967; Smith 1967, 41–42).

It would be unusual if such a rambling old house did *not* have drafts and temperature variations and fluctuations together with odd noises caused by changing temperatures, the settling of an old structure, and other causes.

Figure 3. "Switchback" staircase takes forty-four steps and seven turns to advance less than ten feet upward and was supposedly created to baffle spirits. But the wall at right shows a silhouette of the original steps; they were replaced due to Mrs. Winchester's debilities.

Fact: The tale of Sarah Winchester's grandiose but unattended reception for local citizens is "pure, unadulterated balderdash!" And although she was indeed trapped by the earthquake and subsequently relocated, that was only for a period of about six months while the house was partially repaired, not six years (Rambo 1967).

• **Fancy:** The Winchester Mystery House is the "most haunted house in the country" ("Global" 2002), being tenanted with "thousands of ghosts and guests" (Harder 1976) as well as "the spirit of Sarah Winchester herself" (Murray 1998, 63). According to *The Encyclopedia of Ghosts and Spirits* (Guiley 2000): "Many visitors are haunted by various phenomena, such as phantom footsteps, odd sounds, eerie quiet, whisperings, sounds of a piano playing, smells of phantom food cooking, cold spots, doorknobs turning by themselves, and windows and doors slamming shut. The floor of the gift shop has been found mysteriously covered with water and items in disarray."

One guide characterized the Daisy Bedroom, where Mrs. Winchester was trapped by the earthquake in 1906, as the room that most frightened him. Ghost hunters Winer and Osborn (1979, 43) asked why: "'I *can't* really pinpoint any one thing,' replied the guide. 'But sometimes that room gets so chilly. Not the whole room but just in certain parts. And there's that feeling when I'm in there alone like maybe I'm being watched, like I'm not alone. Some of the others told me that they get the same feeling in that room. . . .'"

Fact: There is no scientific evidence that the Winchester Mystery House—or any place—is haunted. As psychologist Robert A. Baker is fond of saying, tongue in cheek, there are instead "only haunted people." The Winchester hauntees are often reporting mere feelings, like the guide frightened by the Daisy Bedroom. I had no such feelings when I lingered in that room and, in any case, they can be the products of imagination provoked by suggestion. This in turn can be attributed to the mansion's gothic ambiance and legends of ghosts which can create a certain expectancy in many people.

As well, it would be unusual if such a rambling old house did *not* have drafts and temperature variations and fluctuations together with odd noises caused by changing temperatures, the settling of an old structure, and other causes, including seismic activity. "Whisperings" can be easily imagined or can be the product of wind or other effects. The sounds of ghostly music can similarly be imaginary. In at least one instance "piano music" was "heard" in the house by one person but not by her companion (Winer and Osborn 1979, 46–47); on another occasion a "psychic" claimed to hear "organ

music" although others who were present did not (Myers 1986). Actual music may even be perceived, as from a radio in a passing car. So bent on fostering mystery are some that, when odd noises are not forthcoming, the *absence* of them—an "eerie quiet"—will do.

In one instance "a shadowy figure emerged from the inner recesses of the huge mystery house" but turned out to be a Winchester staffer (Winer and Osborn 1979, 46). Again, an elderly woman a tour group saw sitting at a kitchen table, which the guide only later thought was a ghost (Myers 1986, 48), may have been just a straggling member of another tour briefly resting. (Whether or not the woman was really "dressed like" Mrs. Winchester, as later recalled, could be a misremembering caused by suggestion.) The occasional apparition may be nothing more than the welling up of a mental image deriving from a daydream or other altered state of consciousness, that is then superimposed upon the visual scene. This may be especially common to those who have traits associated with a fantasy-prone personality (Nickell 2000)—like "psychic" Sylvia Browne who described being watched by two spirits from across a room (*Winchester* 1997, 42).

In one instance "a shadowy figure emerged from the inner recesses of the huge mystery house" but turned out to be a Winchester staffer.

Figure 4. Investigator Vaughn Rees points to damage from the 1906 earthquake in the Daisy Bedroom. The room's austere appearance may help foster creepy feelings there. (Photos by Joe Nickell.)

A caretaker's being awakened one night by an *unlikely* sound—that "of a screw being unscrewed, then hitting the floor and bouncing onto a carpet runner" (*Winchester* 1997, 42)—might be due to a "waking dream." This is an especially real-seeming occurrence, although actually a common type of hallucination that takes place in the twilight between wakefulness and sleep (Nickell 1995). Additional reported occurrences may have still other mundane explanations, such as reported food smells (wafting from the gift-shop restaurant?), "mysterious moving lights" (reflections, as from one of the mansion's art-glass windows framed with glittering "jewels"?), a water-soaked floor (a leak, or spill or condensation or prank or . . . ?), etc. (*Winchester* 1997, 19; Murray 1998; Myers 1986).

Once the idea that a place is haunted takes root, almost any unknown noise, mechanical glitch, or other odd occurrence can become added "evidence" of ghostly shenanigans—at least to susceptible people. They often cite "unexplainable" phenomena, but they really mean "unexplained" and that does not in any way infer the supernatural. To suggest that it does is to engage in a logical fallacy called arguing from ignorance, the stock-in-trade of credulous paranormalists and outright mystery-mongering writers.

Not everyone is susceptible. My docent, a Senior Tour Guide at Winchester Mystery house (Palomo 2001), has had no experiences herself although, if others are to be believed, she has had endless opportunities. From three decades of ghost investigating, I have noted a pattern which suggests that, as the level of individuals' ghostly experiences rises, so does their propensity for imagination and fantasy (Nickell 2000)—evidence, it seems, for "haunted people."

Acknowledgments

I wish to thank the courteous staff at Winchester Mystery House for their help with my investigation, especially Cathy Palomo, my tour guide, and Shozo Kagoshima, who handles public relations. I am also grateful to Vaughn Rees of CFI–West for assistance with my "California tour" that was above and beyond the call of duty. I also appreciate the research assistance of Tim Binga, Director of CFI Libraries, and the manuscript-preparation skills of Ranjit Sandhu.

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Ica Stones: Yabba-Dabba-Do!

We all know that humans and dinosaurs actually coexisted, even if that only happened in Hanna-Barbera's *The Flintstones* cartoons and in some popular sci-fi movies. But what about reality? Was there ever a time when a triceratops snorted at some bearded man crossing its path? Or when some desperate girl ran away screaming with a hungry T. Rex on her heels?

All scientific evidence so far tells us that this has never been the case. Modern man first appeared on Earth a few million years after the last dinosaur thought something like: "Hey, where's everybody?"

This fact alone should rest the case once and for all, one thinks, but as it usually happens, things on this strange world of ours are never that simple. As we have recently seen (Polidoro 2002), until a few years ago there were some people who were sure that a pterodactyl had survived up until the Civil War era only to be shot down by some overweight Union soldier. There was even a photograph that someone apparently snapped in the 1860s to commemorate the event. As we now know, the whole thing turned out to be just a hoax, courtesy of the creators of *The Blair Witch Project.*

Such revelations obviously never stop those seeking evidence of something they intuitively know to be true: dinosaurs and men shared the same land and sometimes the same stomach.

Is there, then, any better evidence for this idea than fake pictures and intuition? Well, would you consider good evidence the existence of, let's see, some ancient drawings depicting dinosaurs done by man at the dawn of time? Of course, you would, right? Good, now brace yourself because such drawings exist!

Welcome the Rolling Stones

In 1994 scientists were stunned by the accidental discovery of some spectacular prehistoric paintings of horses, rhinoceros, lions, buffalo, and mammoths on the walls of a cave at Ardeche Valley, south-eastern France, considered to be the world's oldest paintings (between 29,700 and 32,400 years old) (Chauvet 1996). Are there, anywhere in the world, similar paintings depicting dinosaurs?

Yes there are, according to some, but they are not drawn with charcoal on some obscure grotto, instead they are carved on thousands of rocks of various shapes and dimensions, apparently hand-etched some 65 to 230 million years ago. And what do these etchings show? You guessed it: brontosaurs, triceratops, stegosaurs, and the whole dino collection of beasts!

That alone would have made the most sensational discovery ever, not only able to eclipse the beauty of the Chauvet paintings, but also most everything else discovered so far.

But wait, there's more! Some other stones, in fact, depict pictures of primitive men hunting and killing dinosaurs and other men flying on the back of pterodactyls. What tops them all, however, are some precisely detailed drawings of ancient men watching the heavens through what look like telescopes and others piloting flying machines or performing open-heart surgery, cesarean section births, and brain transplants!

Are we then in the presence of the astounding proof that not only dinosaurs lived until "recent" times but also that ancient men were far more advanced than we ever thought possible? Just give me a few more minutes before jumping to conclusions, will you?

Let's Rock!

The story begins in 1966, in Ica, a small town on the south coast of Peru, when a Peruvian physician, Dr. Javier Cabrera Darquea, received a small carved rock as a gift for his birthday. The carving looked ancient but when Dr. Cabrera saw it the first thing he thought was that it was a drawing of an extinct fish.

From that moment on, hearing of the extreme interest that the good doctor showed for that rock, local natives approached him with the fantastic news that if he wanted more stones they had a few and could sell them to him. He wanted them and he got them. Actually, he got so many of them (about 15,000)

Massimo Polidoro is an investigator of the paranormal, author, lecturer, and co-founder and head of CICAP, the Italian skeptics group.

that he allegedly abandoned his career in medicine in Lima to open up the Museo de Piedras Grabadas (Engraved Stones Museum) in Ica where he housed his collection.

News of the opening of such a museum were greeted with hurrahs by at least three groups of people, as Robert Todd Carroll points out in his *Skeptic's Dictionary* (Carroll 2002): "a) those who believe that extraterrestrials are an intimate part of Earth's 'real' history; b) fundamentalist creationists who drool at the thought of any possible error made by anthropologists, archaeologists, evolutionary biologists, etc.; and c) the mytho-historians who claim that ancient myths are accurate historical records to be understood literally."

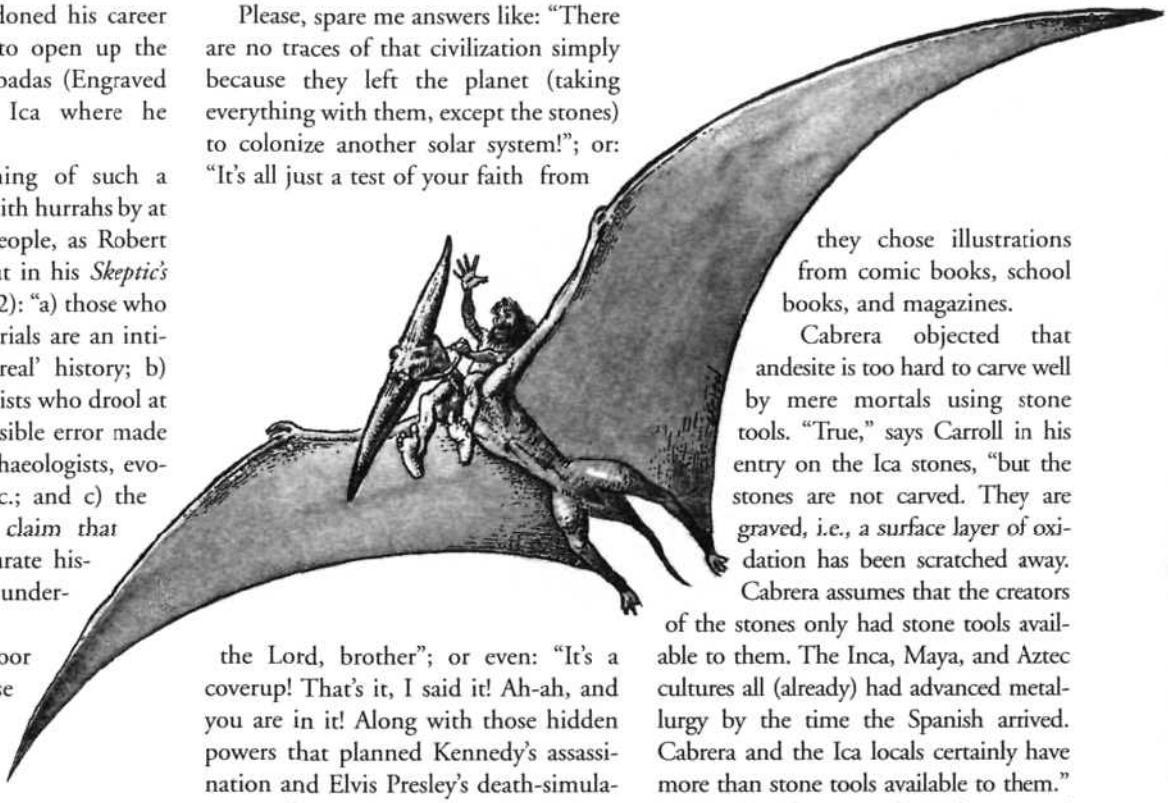
Please, allow this poor European to dispense with the creationists' pretenses, considered on this side of the ocean to be totally absurd not only by any sensible people hearing them but also by many Catholics, the Pope included.

The question, however, remains: since man first appeared on Earth about 2 million years ago, while dinosaurs were already extinct approximately 60 million years earlier, how could these stones be authentic?

Stoned

Now, there are many things in this story that ring more than one alarm bell: 1) since when does one need to get specialized knowledge in extinct fish to become a medical doctor?; 2) exactly what kind of extinct fish is depicted on that famous first stone and when did it become extinct?; 3) How is it that if there once was such an evolved civilization able to build telescopes and flying machines, and perform microsurgery, the best they could do to preserve the memory of their existence was to carve crude drawings on some stones?; 4) If such a civilization really existed, why is it that nowhere else in the world can traces of their existence be found?; 5) And finally, why is it that no dinosaur's fossils can be dated to an age contemporary with man?

Please, spare me answers like: "There are no traces of that civilization simply because they left the planet (taking everything with them, except the stones) to colonize another solar system!"; or: "It's all just a test of your faith from the Lord, brother"; or even: "It's a coverup! That's it, I said it! Ah-ah, and you are in it! Along with those hidden powers that planned Kennedy's assassination and Elvis Presley's death-simulation and . . ." Thank you, thank you, I've got the picture: don't call us, we'll call you.



We are trying here to examine the facts from a scientific point of view and would like to get scientific (or, at worst, scientific "sounding") answers.

The matter could be easily solved by dating the stones. Have they been dated yet? Nope, sorry. Carbon dating can only be done on artifacts that contain organic material, and the stones do not. The only way to date them would be to examine the strata in which they were found.

Okay, then: what about that strata? Well, there's another little problem here: no one knows exactly were the stones come from. Some say they were found by locals on the bed of a river, others in an unidentified cave.

As compensation for these shortcomings, however, one could read a very revealing interview with a Basilio Uchuya and his wife, Irma Gutierrez de Aparcana, two peasants from Callango, published some years ago by *Mundial* magazine (Anonymous 1975). In it, Basilio and Irma admit that all of the stones they sold to Cabrera they had carved themselves. As for the subjects to be depicted on the stones it was easy: they chose illustrations from comic books, school books, and magazines.

Cabrera objected that andesite is too hard to carve well by mere mortals using stone tools. "True," says Carroll in his entry on the Ica stones, "but the stones are not carved. They are graved, i.e., a surface layer of oxidation has been scratched away. Cabrera assumes that the creators of the stones only had stone tools available to them. The Inca, Maya, and Aztec cultures all (already) had advanced metallurgy by the time the Spanish arrived. Cabrera and the Ica locals certainly have more than stone tools available to them." That yellowish, ancient layer that covered the stones was as easily obtained, said Basilio: once the etching was done, the stones were placed in a poultry pen and chickens did the rest. Finally, a recent examination of the stones, done in Barcellona by José Antonio Lamich, founder of the Spanish "Hipergea" research group, revealed signs of sandpaper and recent carvings, thus fueling the hoax hypothesis. When questioned why they did it, the hoaxers answered that etching stones was easier than tilling the soil.

Great! What time is it, now? Oops, that late! Maybe I can make it for a late night showing of *Attack of the Clones*: it's still science fiction, agreed, but at least in the movie they have better special effects.

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Where Have You Gone, Commander Quasgaa?

UFOlogist Karl Pflock has done what is seemingly impossible these days—he has come up with a pro-UFO theory that is actually new. More than a few veteran UFOlogists are unhappy with the sensationalism and low quality of UFO cases in recent years (although the majority seem not to notice or to care). They long for the Good Old Days back in the 1950s and 1960s, when UFOs and their occupants behaved like nuts-and-bolts spacecraft and living spacemen were supposed to behave (instead of today's typical report of aliens floating in through bedroom walls and "beaming" a sleeping victim up to a distant craft for dreamlike sexual activities). Why have the type and kind of reports changed? Skeptics of various stripes have tended to put forth socio-psychological explanations: the reports do not describe real events, and the reports have changed because society has changed. But Pflock sees it a different way: He suggests that the aliens *were* here during UFOlogy's Golden Age, but they've since left.

Karl Pflock. Credit: Gildas Bourdais & Karl Pflock

Pflock is the author of *Roswell: Inconvenient Facts and the Will To Believe* (Prometheus Books, 2001—see www.prometheusbooks.com/site/catalog/book_962.html), a skeptical look at the alleged Roswell saucer crash. Pflock would say that the aliens probably were indeed here at the time of the supposed crash in 1947, but based on the evidence he lets them off the hook for this incident. He also writes a "fifth column" for James Moseley's UFO gossip sheet, *Saucer Smear* (see www.martiansgo home.com/smear/).

Pflock isn't willing to commit himself to a hard and fast date for the last authentic UFO case, but he suggests the following scenario as a "working hypothesis":

> Based on the data, I'm subjectively certain that we have been visited by nonhuman intelligent beings—to my 1950s-conditioned mind, most likely from an extra-solar planet of our galaxy. However, we do not yet have proof of this—as opposed to very strong evidence pointing to it—though such proof very well may be in the data already in hand, as yet unrecognized as such.
>
> I use the past tense advisedly. If I am correct that some sightings were observations of such visitors and their vehicles, I suspect that they were here and left some time ago—arriving in the early to mid-1940s, departing in the late 1960s or early 1970s. . . . They studied our entire system and us quite closely. Once in a while a couple of grad students got out of hand and buzzed the natives. On occasion some ambitious scientists overstepped a bit and interfered with the locals. . . .

Pflock suggests that the strongest evidence of alien visitation are cases like the "classic" Trent photos of 1950 (see www.debunker.com/trent.html) and the Nash-Fortenberry airline pilot sighting of 1952. He also is big on "the famous, and in my considered opinion, real 1961 abduction of Barney and Betty Hill," although the psychiatrist to whom the Hills first told this story didn't believe it, and Betty Hill has since gone on to report—among other things—seeing entire squadrons of UFOs in the skies over New Hampshire, babysitting a ghost, and watching a truck levitate. Pflock's own experience as a youth seeing a "strangely-behaving light in the sky," along with four other people, has also contributed to his belief that at least some UFO sightings *were* real, even if none of them seem to be today.

Pflock suggests 1973 as a tentative date for the alien departure, which happens to coincide with the last great wave of UFO sightings, at least in the U.S. The implications of his theory for UFOlogy are enormous: Every UFO sighting and abduction claim occurring from about 1974 onward is totally, 100 percent bogus. This would invalidate such UFOlogical classics as the Travis Walton "abduction" (Pflock has elsewhere noted that Walton's account seems to have "borrowed" from Heinlein's science fiction—see this column, July/August 2001); all of the "bedroom abduction" accounts put forth by Budd Hopkins and "the threat" to Earth as discerned by David Jacobs; the Mexico City sightings and videos; and all of the Space Shuttle "UFO videos," to mention just a few.

One possibility to consider is that

Robert Sheaffer's World Wide Web page for UFOs and other skeptical subjects is at www.debunker.com.

the aliens did not leave Earth, but simply migrated to the South American country of Chile. Because the locals have reported so many UFO sightings during the past two decades, Miguel Marquez, the mayor of the Maipo River region near Santiago, has declared his region an official "UFO tourism zone" (see www.siliconvalley.com/mld/siliconvalley/3463607.htm). He plans to have two observation centers erected, mark the sites of local sightings, and even offer workshops on important subjects such as how to photograph alien visitors. One Chilean astronomer suggested that people were confused by seeing the bright center of the southern Milky Way, or else the Southern Lights owing to Chile's southern latitude. A better suggestion comes from UFO skeptic James Oberg, who notes that Chile "is on the ground track of satellite launchings from Russia's Plesetsk space center, and rocket reboost firings and fuel dumps have been regularly occurring over that part of the world for about thirty years."

Meanwhile, here in the U.S. the entire UFO field is presently *very* quiet, compared to just a few years ago. Veteran UFOlogist James W. Moseley writes, "Let's face it, folks: Things are slow in UFOlogy these days. Most of Farish's December 2001 issue [a UFO newsclipping service] is devoted to crop circles and other overseas matters, as there just isn't enough going on, here on this side of the pond." John Velez, the Web master of the Abduction Information Center (www.virtuallystrange.net/aic/) writes that "the number of reports that I receive directly has gone from a whopping five to fifteen reports a *day* to maybe one or two a week," and this is in spite of a steady increase in visits to his Web site. Mark Rodeghier of CUFOS has also recently noted that the number of abduction reports they receive has been steadily declining over the past few years. Velez speculates, tongue-in-cheek, "Have the 'Bugs' finally collected enough human DNA? Are the 'aliens' through with us? Has 'Phase Two' of whatever the hell it is 'They' are up to been completed/accomplished?" Perhaps the recent decline in abductions is further evidence that the aliens have departed, although Pflock would place their departure much farther back than about the year 2000. The recent cancellation of *The X-Files* is probably a reflection of the public's satiation with UFO abduction and conspiracy tales, which can only titillate for so long until the fickle public taste clamors for some novel entertainment. UFOs will almost certainly be back—they've gone into hibernation several times before—although it will probably require some new angle or new "blockbuster" conspiracy claim to revive them. It's also possible that UFOs might be supplanted by some entirely new and unexpected form of conspiracy-related fantasy entertainment that gives the public the same vicarious thrill of imaginary but exciting unknown powers.

* * *

Mr. Philip H. Krapf has sometimes described himself as the retired Metro Desk Editor of the *Los Angeles Times*, having shared in a team Pulitzer Prize, although his position there has at other times been more accurately described as "copy editor." But no matter: he soon went to work writing a bizarre tale of UFO contact and abduction. This should hardly be news—hardly a day goes by, it seems, that we don't hear a tale along these lines. What is remarkable, however, is not his tale, but rather his success in getting it believed. Krapf says that on June 11, 1997, the aliens whisked him aboard their spacecraft, subjected him not to medical examinations but instead to three days of drawn-out meetings with various members of the interstellar bureaucracy, and commanded him to begin writing a book. The finished product became *The Contact Has Begun* (Hay House, 1998). It reportedly sold 20,000 copies, and was soon followed up by *The Challenge of Contact* (Origin Press, 2001).

Krapf writes of his contact with The Verdants, who are an enlightened, peace-loving race coming from a planet that is 14 million light-years away. They have somehow managed to park a spacecraft directly behind the Moon, where we can't see it. These superior beings, who represent an Intergalactic Federation, are strict vegetarians. They promise

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a wonderful future for Earth in which all our needs will be met and everyone lives in peace and harmony. But there's a catch: approximately 20 percent of Earth's population is too greedy and self-centered to accept an egalitarian utopia. So these un-peace-loving people must be peacefully rounded up and peacefully transported to remote places of exile, whether they like it or not. They must also not be allowed to reproduce any more of their miserable lot, so that means they'll have to be sterilized as well. Peacefully, of course, as the Verdants carry no weapons.

While Krapf was aboard the spacecraft, he recognized many other prominent people who were undergoing the same process of education that he was. Eight hundred fifty of these "ambassadors" were scheduled to begin speaking out in early 2002, and meeting with Earth's leaders to prepare them for humanity's forthcoming rebirth, in a city appropriately named Genesis, that will be built overnight by the aliens.

The Challenge of Contact carries endorsements from UFO promoters Art Bell, Daniel Sheehan, Leo Sprinkle, and Robert O. Dean, which should come as no surprise. Perhaps more surprising is its foreword from Silicon Valley's millionaire UFO promoter Joe Firmage, who one hopes would have enough sense to stay away from such blatant balderdash, but obviously doesn't. While many mainstream UFOlogists have expressed serious doubts about Krapf's claims, he is nonetheless quickly becoming a major attraction at UFO and New Age conferences.

The first public announcements from our new alien overlords were supposed to have already occurred. Skeptics like myself would obviously be among those that Krapf's peaceful Space Overlords would have to lock away. However, Krapf told his audience at the 2001 Bay Area UFO Expo that he had been whisked back to the Verdants' ship, "The Goodwill," last September 11. He was informed that the events of that day had convinced the aliens that humanity was still too barbaric to join the Galactic Federation, and so the plans for immediate contact were being indefinitely postponed—which thereby conveniently gets him off the hook for his dramatic prediction for the following year. So for better or worse, the Intergalactic Utopia will not immediately be upon us. At least Mr. Krapf was wise enough to provide an excuse for his failed prediction *before* its failure was obvious—prophets typically wait until afterward, yet few disciples seem to care. □

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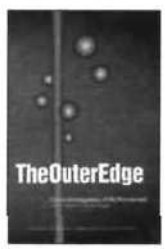

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A Skeptical Look at September 11th

How We Can Defeat Terrorism by Reacting to It More Rationally

At the one-year anniversary, we examine reactions to the September 11, 2001, attacks in the context of other causes of premature deaths. An objective of terrorism is to multiply damage by inducing irrational fears in the broad population. One defense is to learn to evaluate such situations more objectively.

CLARK R. CHAPMAN and ALAN W. HARRIS

Human beings might be expected to value each life, and each death, equally. We each face numerous hazards—war, disease, homicide, accidents, natural disasters—before succumbing to "natural" death. Some premature deaths shock us far more than others. Contrasting with the 2,800 fatalities in the World Trade Center (WTC) on September 11, 2001 (9/11), we barely remember the 20,000 Indian earthquake victims earlier in 2001. Here, we argue that the disproportionate reaction to 9/11 was as damaging as the direct destruction of lives and property. Americans can mitigate future terrorism by learning to respond more objectively to future malicious acts. We do not

Customers at a Pittsburgh, Pennsylvania, Wal-Mart watch President Bush give his speech to the nation after the Sept. 11 terrorist attacks. Credit: C. E. Mitchell/Black/Star.

question the visceral fears and responsible precautions taken during the hours and days following 9/11, when there might have been even worse attacks. But, as the first anniversary of 9/11 approaches, our nation's priorities remain radically torqued toward homeland defense and fighting terrorism at the expense of objectively greater societal needs. As we obsessively and excessively beef up internal security and try to dismantle terrorist groups worldwide, Americans actually feed the terrorists' purposes.

Every month, including September 2001, the U.S. highway death toll exceeds fatalities in the WTC, Pentagon, and four downed airliners combined. Just like the New York City firefighters and restaurant workers, last September's auto crash victims each had families, friends, critical job responsibilities, and valued positions in their churches and communities. Their surviving children, also, were left without one parent, with shattered lives, and much poorer than the 9/11 victims' families, who were showered with 1.5 million dollars, per fatality, from the federal government alone. The 9/11 victims died from malicious terrorism, arguably compounded by poor intelligence, sloppy airport security, and other failed procedures we imagined were protecting us. While few of September's auto deaths resulted from malice, neither were they "natural" deaths: most also resulted from individual, corporate, and societal choices about road safety engineering, enforcement of driving-while-drunk laws, safe car design, and so on.

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A Lack of Balance

Why does 9/11 remain our focus rather than the equally vast carnage on the nation's highways or Indian earthquake victims? Some say, "Oh, it was a natural disaster and nothing could be done, while 9/11 was a malicious attack." Yet better housing in India could have saved thousands. As for malice, where is our concern for the 15,000 Americans who die

annually by homicide? Apparently, the death toll doesn't matter, not if people die all at once, not even if they die by malicious intent. We focus on 9/11, of course, because these attacks were terroristic and were indelibly imprinted on our consciousness by round-the-clock news coverage. Our apprehension was then amplified when just a half dozen people died by anthrax. Citizens apparently support the nation's sudden, massive shift in priorities since 9/11. Here, we ask "Why?"

Suppose we had reacted to 9/11 as we did to last September's auto deaths. That wouldn't have lessened the destroyed property, lost lives and livelihoods, and personal bereavement of family and associates of the WTC victims. But no billions would have been needed to prop up airlines. Local charities wouldn't have suffered as donations were redirected to New York City. Congress might have enacted prescription drug benefits, as it was poised to do before 9/11. Battalions of National Guardsmen needn't have left their jobs to provide a visible "presence" in airports. The nation might not have slipped into recession, with resulting losses to businesses, workers, and consumers alike. And the FBI might still be focusing on rampant white-collar crime (think Enron) rather than on terrorism. While some modest measures (e.g., strengthening cockpit doors) were easy to implement, may have inhibited some "copycat" crimes, and may even lessen future terrorism, we believe that much of the expensive effort is ineffective, too costly to sustain, or wholly irrelevant.

Some leaders got it right when they implored Americans after 9/11 to return to their daily routines, for otherwise "the terrorists will win." Unfortunately, such exhortations seemed aimed at rescuing the travel industry rather than articulating a broad vision of how to respond to terrorism. We advocate that most of us more fully "return to normal life." We suggest that the economic and emotional damage unleashed by 9/11, which touched the lives of all Americans, resulted mostly from our *own* reactions to 9/11 and the anthrax scare, rather than from the objective damage. We recognize that our assertion may seem inappropriate to some readers, and we are under no illusion that natural human reactions to the televised terrorism could have been wholly averted and redirected. We, too, gaped in horror at images of crashing airplanes and we contributed to WTC victims. But from within the skeptical community there could emerge a more objective, rational alternative to post-9/11. Citizens could learn to react more constructively to future terrorism and to balance the terrorist threat against other national priorities. It could be as important to combat our emotional vulnerability to terrorism as to attack Al Qaeda.

Terrorism, by design, evokes disproportionate responses to antisocial acts by a malicious few. By minimizing our negative reactions, we might contribute to undermining terrorists' goals as effectively as by waging war on them or by mounting homeland defenses. We do *not* "blame the victims" for the terrorists' actions. Rather, we seek that we citizens, the future targets of terrorism, be empowered. As Franklin D. Roosevelt famously said, "the only thing we have to fear is fear itself." We can help ensure that terrorists don't win if we can minimize our fears and react more constructively to future terrorism. We don't suggest that this option is easy or will suffice alone. It may not even be possible. But human beings often best succeed by being rational when their emotions, however tenacious and innate, have let them down.

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Death and Statistics

It is a maxim that one needless or untimely death is one too many. So 20,000 victims should be 20,000 times worse. But our minds don't work that way. Given the national outpouring of grief triggered by the estimated 6,500 WTC deaths, one might have expected celebration in late October when it was realized that fewer than half that many had died. But there were no headlines like "3,000 WTC Victims Are Alive After All!" The good news was virtually ignored. Weeks later, many—including Defense Secretary Donald Rumsfeld—continued to speak of "over 5,000 deaths" on 9/11.

To researchers in risk perception, this is natural human behavior. We are evolved from primitive nomads and cave dwellers who never knew, personally, more than the few hundred people in their locales. Until just a few generations ago, news from other lands arrived sporadically via sailors; most people lived and died within a few miles of where they were born. Tragedies invariably concerned a known, nearby person. With the globalization of communication, the world—not just our local valley—has entered our consciousness. But our brains haven't evolved to relate, personally, to each of 6 billion people. Only when the media singles out someone—perhaps an "average layperson" or maybe a tragic exception like JonBenet Ramsey—do our hearts and minds connect.

When an airliner crashes, and reporters focus on a despairing victims' spouse or on the last cellular phone words of a doomed traveler, our brains don't think statistically. We imagine ourselves in that airplane seat, or driving to the airport counseling center when our loved one's plane is reported missing. Actually, 30,000 U.S. commercial flights occur each day. In 2001, except for September 11th and November 12th (when an airliner crashed in Queens, New York, killing more passengers and crew than in the four 9/11 crashes combined), no scheduled, U.S. commercial air trips resulted in a single passenger fatality. Indeed, worldwide airline accidents in 2001—including 9/11—killed fewer passengers than during an average year. But statistics can't compete with images of

emergency workers combing a crash site for body parts with red lights flashing. We are gripped by fear as though the tragedy happened in our own neighborhood, and another might soon happen again.

Some responses to 9/11 were rational. Soon after jumbo jets were used as flying bombs, workers in landmark skyscrapers might reasonably have feared that their building could be next. With radical Muslims preaching that Americans must be killed, it might behoove us to avoid conspicuous or symbolic gatherings like Times Square on New Year's Eve or the Super Bowl. Surely disaster managers must plug security loopholes that could permit thousands or millions more to be killed. But when police chiefs of countless middle American communities beef up security for *their* anonymous buildings, and search fans entering hundreds of sports fields to watch games of little note, official reactions to terrorism have run amok. To imagine that Al Qaeda's next target might be the stadium in, say, Ames, Iowa, is far-fetched indeed.

Disproportionate expenditures on marginal security efforts take attention, time, and resources away from other more productive enterprises.

Finite Resources, Infinite Alarm

Americans' WTC fears only grew when six people died from mailed anthrax. Postal officials patiently explained that public risks were minimal. But millions donned gloves to open their mail or gingerly threw out unopened mail; post offices rejected letters lacking return addresses; urgent mail was embargoed; and for weeks the national dialog centered on one of the least hazards we face. An NPR radio host asked the Postmaster General if the whole U.S. Postal System might be shut down, despite expert opinion that—in a world faced with diabetes, salmonella poisoning, and AIDS—anthrax will remain (even as a biological weapon) a bit player as a cause of death. Its sole potency is in the context of terrorism: if, by mailing lethal powder to someone, the news media choose to broadcast hysteria into every home so that the very future of our postal system is questioned, then the terrorist has deployed a powerful weapon indeed. But his power would be negated if we were to react to the anthrax in proportion to its modest potential for harm.

Research on risk perception has shown that our reactions to hazards don't match the numerical odds. We fear events (like airliner crashes) that kill many at once much more than those that kill one at a time (car accidents). We fear being harmed unknowingly (by carcinogens) far more than by things we feel we control ourselves (driving or smoking). We fear unfamiliar technologies (nuclear power) and terrorism far more than prosaic hazards (household falls). Such disproportionate attitudes shape our actions as public citizens. Accordingly governments spend vastly more per life saved to mitigate highly feared hazards (e.g., on aircraft safety) than on "everyday" risks (e.g., food poisoning). Risk analysts commonly accept, with neutral objectivity, the disparity between lay perceptions and expert risk statistics. Sometimes it is justifiable to go beyond raw statistics. Depending on our values, we might be more concerned about unfair deaths beyond an individual's control than self-inflicted harm. We might worry more about deaths of children than of elderly people with limited life expectancies. We might dread lingering, painful deaths more than sudden ones. We might be more troubled about "needless" deaths, with no compensating offsets, than about fatalities in the name of a larger good (e.g., of soldiers or police). Or, in all these cases, we might not.

Why should terrorism command our exceptional attention? That the 9/11 terrorists maliciously attacked the symbolic *and actual* seats of our economic and military power (WTC/Wall Street and the Pentagon) *should* concern us if we truly think that future attacks might destroy our society. But who believes that? Government responses seem directed mostly at stopping future similar attacks . . . which returns us full circle to the question: why should that have become our primary national goal, at the sacrifice of tens of billions of dollars, of some of our civil liberties, of our travelling convenience, and of many of our pre-9/11 priorities?

Instead of rationally apportioning funds to the worst or most unfair societal predicaments, homeland security budgets soar. Nearly every airport administrator, city emergency management director, mayor, legislator, school district supervisor, tourist attraction manager, and plant operations foreman felt compelled after 9/11 to "cover their asses" by visibly enhancing their facility's security. Superfluous barricades were erected, search equipment purchased, and guards hired. Postage rates and delivery delays increase as envelopes are searched for anthrax. Even the governor of West Virginia announced a "West Virginia Watch" program; while some vigilance in that state does no harm, it is unlikely that Wheeling is high on Osama bin Laden's target list.

Meanwhile, programs unrelated to "homeland security" suffer. Finite medical resources were diverted to comforting people that their flu symptoms weren't anthrax . . . or testing to see if they were. Charitable funds that would have nurtured the homeless flowed, instead, to wealthy families of deceased Wall Street traders. Funds for education and pollution control go instead to "securing" public buildings and events. Billions of extra tax dollars are spent on military operations in Pakistan and Afghanistan rather than on enhancing American productivity. If we truly believe in "life, liberty and the pursuit of happiness" and that each life is precious, we must resist selfish forces that would take advantage of our fears and squander our energies and fiscal resources on overblown security enhancements.

Many say that spending for extra security can do no harm. But there *is* harm when politicians act on views, like those of a New Yorker who earlier this year disparaged complaints about

airport queues, saying, "I hope that they will be inconvenienced, and will always be inconvenienced, because we should never forget the 5,000 [*sic*] who died." "Inconvenience" sounds innocuous, but it means lost time, lost money, lost productivity, as well as increased frustration and cynicism. Disproportionate expenditures on marginal security efforts take attention, time, and resources away from other more productive enterprises. Moreover, our civil liberties are eroded by the *involuntary* nature of our "sacrifices." When a person irrationally fears crowded elevators and takes the stairs instead, only that person suffers the inconvenience of their personal response. But when everyone, fearful or not, is forced to suffer because of the fears of others, then such measures become tyrannical: we should expect rational deliberation and justifications by our leaders before accepting them. But in the aftermath of 9/11, tens of billions of dollars were immediately reallocated with little public debate. Skeptics might well question our society's acquiescence to popular hysteria and proactively challenge our leaders to balance the expenditures of our resources.

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Misperceptions of Risk

Consider some misperceptions of risk. Many news headlines just before 9/11 concerned shark attacks and the disappearance of Chandra Levy, an extreme distortion of serious societal issues (only ten people annually are killed by sharks worldwide). We can laugh at, or bemoan, the triviality of the media. But such stories reflect our own illogical concerns. If, in allocating funds among different hazards, we deliberately *choose* to value the lives of Manhattan skyscraper office workers, postal employees, or airline frequent flyers more than we value the lives of agricultural workers or miners, it is a conscious, informed choice. But it is rarely objectivity that informs such choices. In order to help laypeople and leaders to put our options into perspective, skeptics, teachers, and journalists alike have a responsibility to put the objective past and potential threats from terrorism into contexts that ordinary people can relate to.

Let's compare 9/11 with other past and potential causes of mass death. Note that we generally can't compare prevention costs with lives saved; at best, we can compare expenditures with lives *not* saved. For example, we can compare the cost of air traffic control with midair collision fatalities, but we can only guess at the toll without any such air traffic control.

• We've noted that 9/11 deaths are similar to monthly U.S. traffic fatalities. Whatever total private/public funds are spent annually, per life saved, on improved highway and motor vehicle safety, alcohol-while-driving prevention efforts, etc., it hardly approaches homeland security budgets.

• The 9/11 fatalities were several to ten times fewer than annual deaths from falls (in the home or workplace), or from suicide, or from homicide. One can question the effectiveness of specific safety programs, counseling efforts, or laws; but, clearly, comparatively paltry sums are spent on programs that would further reduce falls, suicides, and murders.

• In autumn 2001, the Center for Disease Control (CDC) predicted that 20,000 Americans would die from complications of influenza during the then-upcoming winter, most of which could be prevented if susceptible people were vaccinated. The CDC advisory was typically buried inside newspapers whose banner headlines dealt with the anthrax attacks, which killed just a few people.

• Twice as many people died in the worst U.S. flood (stemming from the 1900 Galveston hurricane) as at the WTC. Floods and earthquakes are major killers abroad (each of ten disasters killed over 10,000 people, and a few over 100,000, during the last three decades, chiefly in Asia) but are minor killers in modern America. Hurricane Andrew did great physical damage even though fatalities were few. What are sensible expenditures for research in meteorology and seismology, for mandatory enhancement of building codes and redevelopment, and for other measures that would mitigate natural disasters?

• The 9/11 fatalities are just 1.5 percent of those in the nation's worst epidemic (half a million died from flu in 1918), and also just 1.5 percent of the *annual* U.S. cancer fatalities. We have waged a "war" on cancer, at the expense of research on other less feared but deadly diseases; this war's success is equivocal (five-year survivability after detection is up, but so are cancer death rates—though mainly due to decades-old changes in smoking habits). Where should "homeland security" expenditures rank against medical expenditures?

• Impacts by kilometer-sized asteroids are extremely rare, but one could send civilization into a new Dark Ages. The annualized American fatality rate is about 5 percent of the WTC fatalities, although such a cosmic impact has only 1/100th of 1 percent chance of happening during the twenty-first century. Just a couple million dollars are now spent annually to search for threatening asteroids. Should we spend many billions to build a planetary defense shield, which would statistically be in proportion to what we now spend on homeland security and the war on terrorism? Might the threat to our civilization's very existence raise the stakes above even the terrorist threat?

To us, these comparisons suggest that the nation's post-9/11 expenditures have been lopsidedly large, and that a balanced approach would "give back" some funds to reduce deaths from falls, suicide, murder, highway accidents, natural disasters (including even asteroid impacts), malnutrition, and preventable or curable diseases . . . and give back our civil

liberties, and just the plain pleasures of life, such as the arts and humanities, exploration, and national parks. And if truly effective means to end wars could be found, they would be especially worthy of funds, given the death toll from twentieth century wars. Before homeland security becomes dominated by vested bureaucracies and constituencies, there may yet be time to question its dominant role in our priorities.

We advocate shifting toward objective cost-benefit analyses and equitable evaluation of the relative costs of saving human lives. Of course, subjective judgements have some validity beyond strict adherence to numerical odds. But we need a national dialog to address these issues dispassionately so that future governmental decisions can eschew immediate, impulsive reactions. Individual skeptics, in our own lives, can exemplify sensible choices. Among the many dumb things we should avoid (e.g., smoking, driving without a seatbelt, or letting kids play with firearms), we must also avoid driving instead of flying, acquiescing uncomplainingly to ineffective searches at local buildings and events, and generally yielding to the new "homeland security" mania. Clear thinking about risks, rather than saying that "any improvement in security is worth it," can reduce our societal vulnerability to terrorism.

One constructive antidote to post-9/11 trauma is to enhance the information available and to foster sound appreciation, evaluation, and use of the information. Life is inherently risky, unpredictable, and subject to things we cannot know...but there are things we *do* know and can understand. Rather than scaring people about sharks, serial killers, and anthrax, the mass media could help people understand the real risks in their everyday environments and activities. Educational institutions should help students develop critical skills necessary to make rational choices. While avoiding intrusions into personal liberties, government could nevertheless collect and assess statistical data in those arenas (like air travel) where potential dangers lurk, concentrating protective efforts and law enforcement where it is most efficacious.

To conclude, we suggest that most homeland security expenditures, which in the zero-sum budget game are diverted from other vital purposes, are terribly expensive and disproportionate to competing needs for preventing other causes of death and misery in our society. While prudent, focused improvements in security are called for, the sheer costs of most security initiatives greatly distort the way we address the many threats to our individual and collective well-being. Our greatest vulnerability to terrorism is the persisting, irrational fear of terrorism that has gripped our country. We must start behaving like the informed, reasoning beings we profess to be.

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'Shall We Fence Off All the Cliffs?'

East of Tucson, Arizona, there is a mountain cliff, over which water sometimes flows, called Tanque Verde Falls. It was once a popular place for young people to visit, get naked, and drink beer. Each year, several would slip over the edge and die on the rocks below. The authorities eventually erected a fence and made it unlawful to approach the cliff's edge. Yet in the mountains surrounding Tucson and throughout the country, there are countless other cliffs and waterfalls, many equally accessible and potentially dangerous. Should we fence them all off, to save lives? Should we ban entry to the Grand Canyon to prevent people from slipping over the edge? Indeed, we could ban access to all rugged lands.

But that would be ridiculous. The countryside, and drinking beer, have inherent dangers. Our society lacks the ability to ensure everyone's perfect safety. But regulations seeking just such near-perfect safety are now imposed on visitors to all U.S. commercial airports. To prevent terrorists from using airplanes as flying bombs, it would be logical to secure the flight decks of large jetliners: strengthening doors, enhancing the security of aircraft controls, perhaps equipping pilots with stun guns, perhaps tightening certification of pilots (to ensure they don't have suicidal or terroristic tendencies).

The portal to secure is the entrance to the flight deck. But following September 11th, new measures also further protect airplane passenger compartments. And entrances to jetways. And especially to concourses. Moreover, a 300-foot perimeter now surrounds airport exteriors within which new security rules are in effect. Even far outside those perimeters, automobiles are checked when they enter airport parking lots. What does any of this have to do with keeping suicidal terrorists from using airplanes as bombs? Very little. And the threat from hijackings, generally, is small: in the three decades before 9/11, only eighty-nine people were killed in events involving U.S. air carriers or airports. Yet, after 9/11, travellers may no longer eat, drink, or even just chat with friends and family inside airport concourses since non-travellers are now banned from entry. How is that a rational response to the WTC collapse? We are erecting fences on all the cliffs.

Sheldrake's Crystals

An exchange of views on morphogenesis leads to the conclusion that testing Sheldrake's ideas about crystallization is useless.

MARCEL van GENDEREN, BART KOENE, and JAN WILLEM NIENHUYS

Rupert Sheldrake is an unconventional scientist—a biologist by training—who has invented morphogenetic fields. Originally, the word *morphogenetic* meant influences on the growth of embryos. One may think of gradient fields of specific signal substances, but the word is actually much older than the idea that signal substances might be involved. In various texts between 1920 and 1960 we find several proposals about the nature of these fields, some of them highly metaphorical.

However, Sheldrake thinks that any kind of natural process that eludes a clear and complete description is partially controlled by such fields, especially when there is some kind of pattern. The basic idea is that such patterns cannot

easily arise naturally, because we don't see how. However, once a pattern is formed, it becomes more and more easy to form again.

Sheldrake thinks that patterns create morphogenetic fields. These fields spread out immediately through the universe without loss in strength. They favor the creation of the same pattern. That is morphic resonance.

Ordinarily chemists think that melting points rise, at least in the literature, because of greater purity. There is no other explanation. Sheldrake thought that this is a circular reasoning, as purity of substances is ascertained by means of melting points.

Sheldrake even thinks that the basic laws of physics have been frozen into their present form by morphic resonance. But any generic phenomenon can be considered as a pattern, so the morphic fields amount to an explanation for almost anything that is not explicable in detail.

Testing these ideas is hard, because anything that is precisely predictable is excluded from morphic resonance.

Sheldrake does claim some evidence from phenomena for which any decent explanation seems to be lacking. Typical examples are flocks of birds, blue tits getting the cream out of milk bottles left at the front door, homing pigeons, clairvoyant dogs, solving crossword puzzles, and crystal formation.

Morphogenesis and Crystals

Sheldrake writes in his book *The Presence of the Past* (1988) about crystallization: "It is in fact well known to chemists that newly synthesized compounds are usually difficult to crystallize: weeks or even months may elapse before crystals appear in a supersaturated solution. Moreover, generally speaking, compounds become easier to crystallize all over the world the more often they are made" (131).

This has been put to the test—but with a computer, under the assumption that filling the memory of a computer is a process akin to crystallization. One may wonder how many people were impressed by this test. Sheldrake certainly wasn't, and our discussion of the thermodynamics of crystallization below will enable the readers to make up their minds on this.[1]

More recently Sheldrake has proposed that easier crystallization would also imply a rise in melting point. Historically many compounds have shown rises in melting points. This suggested a test to one of the sympathizers of the Dutch skeptics organization Skepsis. In research labs, for instance those of pharmaceutical companies, many new compounds are routinely made.

Why not save some of these in a refrigerator and re-measure their melting points after some time? Doing this with, say, a dozen compounds that were synthesized and crystallized again, and a dozen compounds for which this didn't happen, might settle the issue. We decided to contact Sheldrake and discuss this with him. This article is the outcome of our discussion with Sheldrake.

We discussed several issues, among them practical matters, such as how to determine melting points. What rise in temperatures should be expected? And should the samples be kept as solutions or as crystals?

Why did Sheldrake think that melting points go up? Why not down, for instance? Why to a limit? Why not up without bounds? Why only after a few weeks or years, rather than a few microseconds or several millennia? What does the melting of a compound have to do with the process of crystallization from a solution?

An important part of the discussion centered on the actual historical rises in melting points. This is important because if one wants to interest a research chemist to spend time and energy on something, then one should present some motivation.

We quickly decided that discussing the theoretical issues should precede the planning of an actual test. Sheldrake wasn't inclined to see any experiment as decisive. He was merely interested in exploratory research. In other words, see what happens. He argued that no skeptic has changed his materialistic world views on the basis of some of Sheldrake's experiments, so why should he do otherwise?

The theory question seemed easy. Sheldrake had consulted with a chemist, who pointed out to him that "if morphic resonance leads to a progressive strengthening of the morphic fields of crystals, not only should they crystallize more readily, but also the stronger field of the crystal should mean that the crystal is more stable and that its melting point should rise the more often the compound is crystallized."

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Ordinarily chemists think that melting points rise, at least in the literature, because of greater purity. There is no other explanation. Sheldrake thought that this is a circular reasoning, as purity of substances is ascertained by means of melting points.

We disagree, and we told him so. Chemists have many ways to ascertain purity of compounds. For the last forty years, any new compound is put into a nuclear magnetic resonance (NMR) machine. Mass spectrometry is another option, (gas) chromatography too. Element analysis for organic compounds consists of burning a sample very carefully and then measuring the amount of combustion products very precisely. This yields the precise amounts of hydrogen, carbon, and nitrogen in the compound, and by comparing it with the theoretical formula, one can estimate the purity. Chemical companies such as Aldrich have on-line catalogs, and they show for many of their products certificates with reports of such purity analyses.

In fact determination of the melting point is hardly—if at all—used to establish purity. To begin with, you need crystals for that, and that means you already have a quite pure substance. Then, determining a melting point is somewhat cumbersome. The most common technique consists of wiggling a tiny amount of powdery material into a capillary tube (one hopes that hygroscopic material doesn't attract water during this process), and then watching the tube contents through an optical device while the tube is suspended in a fluid bath that is slowly heated. The information from a single melting point is limited to just a single number. At most one can see from such a number that the purity has not improved compared to a previous effort. The other methods give much more information.

Melting and the Gibbs Energy

What is the chemical theory behind melting points? When chemists describe chemical processes, especially those that proceed without change in temperature and pressure, they often use a theoretical quantity called the Gibbs free energy (named after the famous nineteenth century American theoretical physicist Josiah Willard Gibbs). One may think that chemical reactions and phase transitions try to go in the direction of lower Gibbs functions for the systems involved.

The role of the Gibbs function in chemical processes, not only melting and evaporation but also chemical reactions, was discovered by the famous French physicist and philosopher of science Pierre Duhem at the end of the nineteenth century.

One should keep in mind that the Gibbs free energy is best thought of as a bookkeeping quantity. It contains an energy term and an entropy term, but the entropy term has a minus sign. For example, if we have ice and water in contact at the melting temperature of ice, then the water has a higher heat content (enthalpy) than the ice. But the addition of melting heat increases the entropy, which means that the energy can be distributed in more different ways among the molecules. Microscopically, entropy is a measure for the number of these ways; macroscopically, an increase in entropy is heat added, divided by the temperature.

In fact there is no difference in Gibbs free energy between ice and water at the melting temperature. If no heat is added to the system, nothing (no freezing, no melting) happens. Only differences in Gibbs free energy make reactions and phase transitions go. Similar remarks apply to a saturated solution in contact with crystals of the dissolved material.

"Nothing happens" is microscopically incorrect. All the time there are water molecules settling into the ice, while others get kicked out. We speak about a dynamic equilibrium: settling down and kicking out occur equally often.

What happens when we add salt to the mixture of water and ice? The salt dissolves, and near the ice surface there are fewer water molecules settling into the ice. The number of ice molecules kicked into the solution doesn't change, so now there is net melting. The dynamic equilibrium can only be established at a lower temperature. Chemists observe that dissolving salt into the water raises the entropy, hence decreases the Gibbs free energy of the fluid, hence creates a difference in Gibbs free energy between ice and fluid, and this "causes" the system to evolve into one with more fluid and less ice. The advantage of using the Gibbs free energy is that one can calculate by how much a given amount of dissolved salt will lower the freezing point, not only for water and salt, but for any compound and any kind of impurity dissolved into a melt.

The result of such a calculation is that the melting temperature goes down—unsurprisingly—in proportion to the concentration of the impurity in the fluid phase.

The decrease is also proportional to the square of the melting temperature of the pure substance in equilibrium with the pure melt (a slightly better approximation is the product of the "pure" melting temperature and the "actual" melting temperature).

However, the decrease is inversely proportional to the melting heat of the substance. That is important to know, because it means that for substances with a small melting heat a little impurity may make a large difference.[2]

Conversely, for a substance with a large melting heat (such as water) enormous amounts of salt are necessary to make the melting temperature go down by an appreciable amount.

If we are dealing with an "impure" crystalline material, we usually have a powder of pure crystals of various

substances. The impurities may, for example, consist of left-over reagents that produced the bulk of the material. The above theory applies to the system consisting of the bulk material covered with a very thin film of impure fluid. Maybe the reader is familiar with the phenomenon that melting ice with salt (and obtaining a cooling effect as well) works better if a bit of water is added to the mixture of ice and salt.

Sheldrake, however, has stated to us that the "Gibbs free energy is not a part of any argument [he] raised," and that it is not particularly relevant. "[T]he morphogenetic field does act as a kind of catalyst." This view corresponds to Sheldrake's view that his morphogenetic fields help probabilistic processes along in some way. On the other hand he stated that if "the Gibbs free energy of a substance is fixed quantity independent of time and predictable in advance," then his hypothesis "does not make sense."

Sheldrake thinks that for many substances there are many slightly different crystal forms possible, each corresponding to a local energy minimum that differs a bit from the others. The morphogenetic field merely helps to choose the best minimum. That means a catalytic action indeed. It would explain quicker and easier crystallization. But Sheldrake also believes that his field somehow makes the crystal stronger in some sense, and thereby protects it a bit against melting, in other words the morphogenetic fields act both as catalyst and as stabilizer. But those two actions are fundamentally different, at least to chemists.

Sheldrake seems to neglect the entropy term in the Gibbs function. In a crystal the entropy is clearly lower than in the fluid. Even so, different crystal forms also differ in the exact amount of freedom of motion of the molecules (that is one of the reasons why the Gibbs function is so hard to compute from theory alone). It is not certain at all that stronger forces between the molecules in a crystal lattice will lower the Gibbs free energy. A tighter packing will lower the entropy, hence raise the Gibbs function.

Nonetheless it seems to us that Sheldrake's hypothesis about melting points is a claim about forces and energies and freedom of motion. For chemists, the Gibbs free energy is what ultimately describes whether the crystal will melt or not at a certain temperature. So implicitly the Gibbs function is involved, but explicitly Sheldrake denies that it plays any role in his thinking. Moreover, explicitly he stated that if the Gibbs function is a fixed quantity, then his hypothesis is out, and implicitly he hypothesizes that the Gibbs free energy of any given crystal can change after it has been formed, merely by having similar crystals produced somewhere in the same or a different lab. From the point of view of chemical thermodynamics, this effect on the stability of crystals means that Sheldrake implicitly supposes that there is an extra term in the Gibbs function. He merely has to tell us what that term is, and then we can study its properties and properly design experiments.

Crystal Glossary

morphogenetic field
In Sheldrake's view, a kind of influence that is created by any characteristic pattern.

morphic resonance
In Sheldrake's view, the morphogenetic field helps to create or sustain analogous patterns. All forms of memory are in fact examples of morphic resonance of a brain with itself at an earlier time. But a substance, for example cocaine, can also "remember" how to form crystals, and so cocaine can perfom better at that task, once cocaine has been crystallized somewhere, sometime. Sheldrake believes that the basic laws of physics have also been created by morphogenetic fields.

crystal
A substance in which the atoms or molecules are ranged in orderly patterns. Often the crystals have chararacteristic shapes. Examples are ice, many minerals such as diamond or the grains in granite, table salt, and sugar.

entropy
In physics, a measure of disorder in a substance. In thermodynamics one divides any heat loss or gain by the temperature, and one obtains then a quantity that is called the change in entropy. Heat is energy of random motion, entropy is a measure for the evenness of the distribution of this energy, more even meaning higher entropy.

Gibbs free energy
A bookkeeping quantity in physics and chemistry, namely total heat (also called enthalpy) minus the product of total entropy and temperature. One may think of any process such as melting or chemical reactions as driven by differences in Gibbs free energy. In an equilibrium situation (ice and water at 0 degrees Celsius, or salt and a saturated brine) the Gibbs free energy of both components is equal, and nothing (no melting, freezing, dissolving etc.) happens. In other words, the melting point is the temperature where the fluid and solid phase have exactly the same Gibbs free energy.

L- and D-forms
When a carbon atom is bound to four different groups or atoms, one gets a molecule that is not identical with its mirror image, much like a left hand and a right hand. In simple cases one is called L and the other D.

amino acids
In an amino acid a carbon atom is bound to a hydrogen atom, one acid group, one amino group and a third group. So unless the third group is just a hydrogen atom (resulting in glycine), amino acids come in L- and D-forms. Proteins are chains of amino acids. Life on earth almost exclusively uses the L-forms of twenty different amino acids; asparagine, threonine and phenyl alanine are three of them.

racemic mixture
A substance containing equal numbers of two types of molecules that are non-identical mirror images of each other.

* * * *

Concrete Examples

Why should those fields not cause the melting points to go up without bounds? Sheldrake answered that many such processes have natural limits, such as the four-minute mile. We were not impressed by his example. The time for running a mile isn't a natural process, but the result of an athlete wanting to outperform others. Comparing track sports to crystals is merely using yet another anthropomorphic metaphor for crystal formation. As most of humankind still can't run a mile in four minutes, morphic resonance doesn't work too well there! Many natural processes, such as the weather, earthquakes, and animal populations, don't go to any limit but keep varying up and down.

The very first microscopically small crystal will contain on the order of 10^{15} molecules. Why is a million billion learning opportunities not enough? For blue tits and people much less learning suffices for much more complicated behavior! To this Sheldrake had essentially no answer. More important, we asked him if he had any concrete examples of inexplicable historical rises in melting points. Sheldrake gave several examples, taken from catalogues of companies such as Aldrich, Merck, and also from the *CRC Handbook of Chemistry and Physics*, the so-called "Rubber Bible." He spent much effort in obtaining substances from chemical companies and checking the melting points by measuring them himself (actually having an assistant do it for him). We emphasize that he actively acquired data to support his views. However, he never provided any purity data.

He gave one famous substance as example: 18-crown-6 crown ether, first synthesized by Charles J. Pedersen, who reported a melting point of 38 to 39.5 degrees in 1977 (all temperatures are in degrees Celsius). Its melting point is now about 4 degrees more, namely 42–45 degrees. Sheldrake won't believe that this modest four degree rise has anything to do with improved purity after more than ten years. Certainly Pedersen must have done his best to get a pure compound? But chemists spend much of their time in isolating, separating, and purifying substances. In this case absence of any increase would mean that chemistry would not have been able to make any progress after this compound was synthesized for the first time.

His other examples were cocaine and seven amino acids. We didn't think they were good examples. The most serious objection is that many of those melting points are listed with the remark: "with decomposition," i.e., at the so-called melting temperature the stuff starts decomposing: it often turns yellow or brown. Among chemists it is assumed that this type of melting point isn't very reliable. The decomposition products can act as impurities with disastrous effects on the melting point, they may be fluid—creating the illusion of melting—and the judgment that a discoloration is visible is somewhat subjective.

Again, there is no problem here for Sheldrake. Melting and decomposing is the same to him: disruption of the structure.

For example, Sheldrake reported a melting point of 239 degrees for threonine in 1934 and 270 degrees in 1993. However, we found modern melting points of slightly over 239 degrees for the racemic mixture of D- and L-threonine, 256 degrees for D- or L-threonine, excepting Aldrich who mentioned 274 degrees for D-threonine, all with decomposition. A chemist must conclude that there is something wrong here. Theoretically mirror symmetric molecules (such as these D- and L-compounds) ought to have the same melting points. Generally speaking, any scientist who can discover a basic difference in physical behavior between mirror symmetric situations would achieve instant fame. The indication "decomposition" however, raises a red flag for a chemist.

Sheldrake didn't seem to care much about discrepancies between D- and L-forms. As far as we can tell, he agrees with us that the limiting value of the melting point should be the same for both forms, but D-forms, or their crystals, are usually newer than the L-forms, which are abundant in life on Earth, so it would take some more time until morphic resonance has brought the D-crystals close to their limit melting point. He sees no cause for concern in difference between L- and D-forms. That happens occasionally, he said. It does require explanation, and in fact there are several standard explanations. One is that in the literature melting points are often copied from older sources, rather than remeasured. Data about the "natural" L-forms are often older than those of the newer D-forms. L- and D-forms are made in different ways, so their impurities differ. More specifically, L-compounds can contain certain amounts of the corresponding D-compounds (or vice versa), which tends to lower the melting point. Only an intensive investigation can reveal which explanation applies in a particular case of a specific item in a specific catalog.

Sheldrake gave another example of a compound whose melting point did not go up, namely asparagine: its melting point was 236 degrees in 1936, and it still is. We checked, but again we found in Aldrich an anomalous high melting temperature of 280 degrees for the (synthetic) D-form, and again melting with decomposition for all forms. So we see here the same mystifying anomalous behavior as for threonine.

We have asked Aldrich for an explanation. They mentioned the standard explanation, but for asparagine they took the trouble to remeasure the melting points of their products. They found for L-asparagine 240.5 degrees, and for D-asparagine 274–280 degrees, which rules out the "copied from older data" explanation in this case.

For the moment, we must consider the melting points of asparagine and threonine as puzzles that might have any of several plausible solutions. Whatever these solutions, one cannot very well say that threonine's melting point has gone up, and asparagine's stayed constant.

Sheldrake says that asparagine in some plants serves to transport nitrogen, from the roots to the leaves. Sometimes the sap of the plant is exuded at the leaftips, the water evaporates, and then the asparagine crystals are left. So crystalline asparagine has been occurring in nature for millions of years, and that explains to him why asparagine melting points don't go up in the literature. He did not proffer an explanation for the high melting point of D-asparagine. His morphic resonance idea predicts a lower melting point for the D-form.

There is only one amino acid that doesn't decompose at the so-called melting point. That is phenylalanine. Here the D- and L-form behave almost exactly the same, and the slight difference can be explained from the purity data which are available in this case.

Conclusion

Experiments to test these theories are possible, and if anybody wants to do them, we would be willing to cooperate in the design phase. But a null result will not change anybody's mind: *certainly not Sheldrake's and not any chemist's. Sheldrake does* not consider chemical thermodynamics, he states things that seem to us to be in contradiction with each other and also with this century-old and well-tested theory, and he only gave anecdotal support for his conjectures.

We see no possibility to convince a professional chemist that there is something worth their effort and their (and their bosses') time to investigate. For that, one needs an example of a substance with a given purity showing an historic rise in melting point that cannot be explained from a change in purity. Sheldrake has not given even a single such example.

This discussion has had some use for us. We know much more about the thermodynamics of melting than we knew before this discussion. It was only halfway through our correspondence that it dawned upon us that we were basically discussing the Gibbs free energy.

Notes

1. See, for example, Francisco J. Varela and Juan C. Letelier, Morphic Resonance in Silicon Chips, SKEPTICAL INQUIRER 12 (3) (Spring 1988), p.298–300. Morphic resonance test (Letters), SKEPTICAL INQUIRER 13 (1) (Fall 1988), p.100–101. Follow-Up, SKEPTICAL INQUIRER 13 (2) (Winter 1989), p. 203–205. The Varela-Letelier experiment was deemed unacceptable *because their computer was controlled by a clock, but the students Warner,* McNelis, and Losh built a clockless computer that, when properly cooled, gave the same results (private communication).

2. For the cognoscenti (most of whom probably had to memorize this very formula during their studies) we mention that the concentration must be given in mol per mol, and then the proportionality constant happens to be the universal gas constant R, times a correction factor close to 1, to account for non-ideal behavior. □

Are Melting Points Constant?

RUPERT SHELDRAKE

(Reply to the article by Van Genderen, Koene, and Nienhuys)

Like van Genderen, Koene, and Nienhuys (subsequently GKN) I am a skeptic, but of a different kind. I think it is important to question fundamental assumptions that are usually taken for granted. In particular, I am skeptical about the idea that the "laws of *nature" are constant. This theory was* built into the foundations of modern science in the seventeenth century, and was originally based on theology. The laws of nature were created by God and shared in God's nature: they were changeless, universal, and omnipotent.

Until the Big Bang cosmology became orthodox in the 1960s, there seemed no reason to challenge this belief. But we now have a radically evolutionary cosmology. In this context, does it make sense to say that all the laws of nature were fixed at the Big Bang, like a cosmic Napoleonic code? Or to claim that they existed before the Big Bang? There can be no experimental evidence for such a claim. This is clearly a metaphysical assertion. Evolutionary cosmology raises the possibility that the laws of nature may themselves evolve.

We can even question the concept of natural "laws." This is a very anthropocentric notion, since only humans have laws. As the English writer C.S. Lewis once said, "To say that a stone falls to earth because it is obeying a law makes it a man and even a citizen." Perhaps the regularities of nature are more like habits than laws. Habits imply a kind of unconscious memory. In my hypothesis of formative causation, I suggest that self-organizing systems, including molecules, crystals, cells, organisms and animal societies, are organized by morphic fields which contain an inherent memory given by the process I call morphic resonance. I give a detailed account of this hypothesis in my book *The Presence of the Past.*

According to this hypothesis, the first time a new chemical substance crystallizes in the history of the universe, there will be no pre-existing morphic field for this compound. But once the chemical has crystallized, subsequent attempts to crystallize it in other places will be influenced by morphic resonance from the first crystals. As the compound is crystallized repeatedly there will be a cumulative effect. It should therefore, on average, become easier to crystallize that chemical.

The morphic field of the crystal works, I suggest, by patterning the crystallization process toward one of the many possible minimum-energy structures that the compound is capable of taking up. Morphic resonance from past crystals should strengthen the morphic field, and hence not only make the compound easier to crystallize, but also more resistant to disruption. Therefore a higher temperature would be necessary to break it up. Thus the melting point would be expected to rise.

According to the hypothesis of morphic resonance, compounds that have crystallized in nature for millions of

years will show little or no change in melting point. There would be a very small incremental effect of new crystallizations against a background of influence from countless crystallizations in the past. By contrast, new compounds first synthesized or crystallized in laboratories or industrial processes should show increasing melting points.

In fact, for example, cocaine in its natural form had a melting point of 98°C in 1915, and its melting point was still the same in 1989. By contrast, cocaine hydrochloride, the cocaine of commerce, is man-made. Its melting point increased from 184°C in 1918 to 197°C in 1989.

Nienhuys first wrote to me four years ago challenging my suggestion that melting points could actually change. I provided a range of examples from the chemical literature showing that such rises apparently occur, some as great as 30°C. When his chemist colleagues checked my figures, they found very similar figures. GKN have now fallen back on the circular argument that when melting points go up, it must mean samples are purer. And how do we know they are purer? Because they have higher melting points! If GKN had actually produced data for changes in purity, their argument might have had some force. In fact for most of the melting points in the older literature no data on purity are available.

GKN have now shifted their ground to theoretical arguments about the Gibbs free energy. In effect, GKN claim that melting points of chemicals are constant because textbook theories assume they are. They bring confusion rather than clarity to the empirical question of whether melting points can actually change. They try to make skepticism about the constancy of melting points seem unnecessary. But whether they like it or not, in an evolutionary universe, the evolution of the regularities of nature is an open question. The comfortable doctrine that all "laws" and "constants" are fixed cannot be taken for granted. If the universe and everything within it evolves, it would be strange if chemistry were somehow immune.

I would be grateful to hear from any chemists who have empirical data relevant to these questions. □

A Last Reply to Sheldrake

MARCEL van GENDEREN, BART KOENE, and JAN WILLEM NIENHUYS

Apparent regularities in data are called laws, especially when they seem to have universal validity. Hence human laws imposed by tradition or authority are only used as metaphors in the context of science. Asking who or what set the laws of nature is confusing the metaphor with the real thing, like asking for the wavelength of the light of reason.

About the Gibbs function, it is Sheldrake, not us who tries to turn the tables. Already for about a century the Gibbs function has served quite well to explain chemical phenomena in general and melting in particular. Sheldrake proposes an entirely different theory in which entropy (an essential term in the Gibbs function) plays no role whatsoever, and in which no distinction is made between catalysis (making reactions go more quickly) and stabilization and which predicts neither magnitude nor speed of these changes in melting points.

He is the one trying to break new ground. Science can progress with the acquisition of new data or with new theory that better explains old data. Sheldrake produces data, but they are not useful, and not only because most of his melting points are "with decomposition." Impurities lower melting points. That's a fact. Chemists are improving their methods all the time. That's a fact too. So it isn't surprising that purities and hence melting points go up. We have explained why they might go up a lot, namely in cases of low melting heat. Sheldrake's data—also these cocaine data—lack essential purity information. We actually told him that such information might be found in specialized literature, but we didn't feel that we should do his work of searching for it.

We repeat that we offered to act as intermediary between him and industrial chemists interested in performing the experiments he proposed. For that he should present convincing data. He didn't.

Sheldrake explained why asparagine should have a constant melting point and threonine not, whereas we found that these substances (as sold by Aldrich) exhibit the same anomalies. Suppose these anomalies would turn out to be inexplicable and not merely the result of unequal admixtures of mirror molecules, then Sheldrake's theory would predict that the D-forms have a low melting point, exactly opposite of reality. How can he maintain that his data warrant a systematic search for support of his ideas?

Science has arrived at understanding evolution and the Big Bang by assuming constancy of laws of nature across the depths of time and space. Observations have never forced science to give up that assumption. Stringing words like "evolution" and "Big Bang" together doesn't make a case for the variability of natural laws in general, let alone for looking for such variation in esoteric subjects like the thermodynamics of melting of organic compounds. □

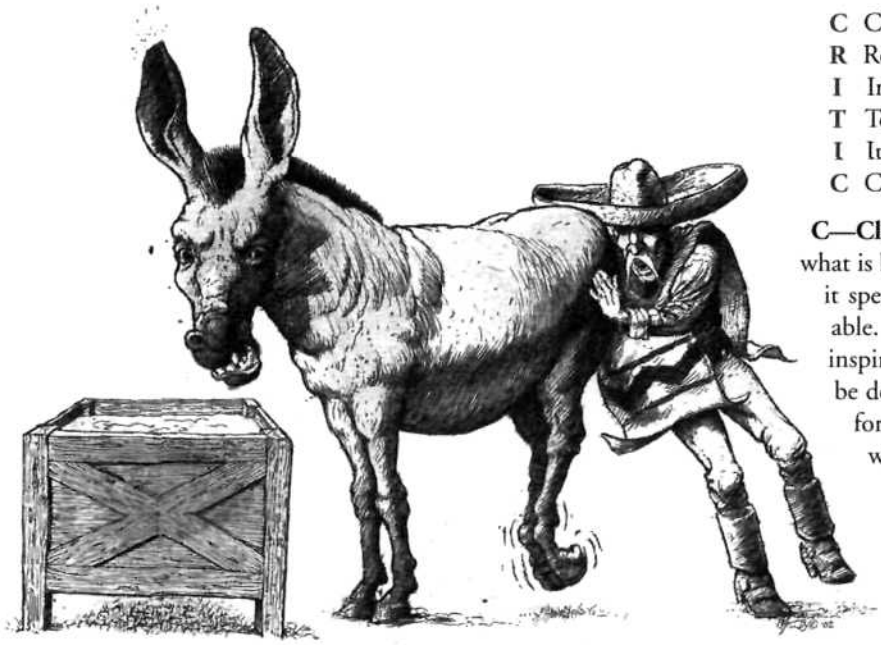
Teaching Skepticism via the CRITIC Acronym and the SKEPTICAL INQUIRER

The CRITIC acronym provides neophyte skeptical students with an easy-to-remember, step-by-step format for applied critical thinking. Practice applying this simple method of critical analysis can include writing CRITIC reports on the feature articles found in the SKEPTICAL INQUIRER.

WAYNE R. BARTZ

Most college students slouch into the first day of class assuming they already know a great deal about the world around them. As a result they may have to unlearn an accumulated wealth of misinformation in addition to absorbing the priceless new pearls of wisdom teachers toss their way. An improvement in critical thinking skills should facilitate that sometimes painful process.

When it comes to widely accepted extraordinary claims, the sources bombarding today's students are rich, the speculations boundless, and critical analysis is generally lacking. Dubious claims familiar to readers of the SKEPTICAL INQUIRER abound: Exposure to "crystal energy" improves health and mental functioning; gifted "psychics" can



describe your innermost desires, divine the future, or speak with the dead; basic "personality traits" can be revealed by studying the features of an individual's face. Students routinely assume such claims to be true, or else they would not be prominently featured on radio and TV, in books, newspapers, and magazines. Rarely is the slightest critical thought demonstrated in credulous media portrayals of paranormal events (recent television network examples include NBC's *The Others* and *Mysterious Ways*). The challenge for an educator is to motivate students to critically evaluate interesting claims without having the benefit of background courses in research methodology and statistics (which most students never take).

Introductory psychology classes have always stressed a scientific approach to the study of behavior, with skeptical modes of thought being emphasized long before "critical thinking" became a buzzword in education. Some years ago a panel of psychologists assembled by the American Psychological Association concluded that the primary objective of an undergraduate psychology degree is graduates who could be described as "amiable skeptics about much of what they encounter." We in the skeptical community might hope this outcome would occur no matter what college major a young person selects, but widespread acceptance of fanciful notions by college-educated adults suggests this is a vain hope. During three decades of teaching college psychology courses and encouraging the development of "amiable skeptics," I devised a practical system of applied critical thought based upon the easy-to-remember acronym CRITIC. It could be used in a variety of courses, is readily understood by most college students, and would probably be effective even with high school and junior high school students. It is basically a simplified application of the scientific method without the complex terminology:

C Claim?
R Role of the claimant?
I Information backing the claim?
T Test?
I Independent testing?
C Cause proposed?

C—Claim: The first task is to describe exactly what is being proposed. Spell it out, define it, make it specific enough to be observable and measurable. For example, how might a claim of crystal-inspired "improved mental functioning" actually be demonstrated? What measurable mental performance would be expected and how would we determine whether or not it actually occurred? With some claims it immediately becomes apparent that we cannot pin down exactly what is being proposed, making it impossible to seriously test the claim. For example, I could assert that invisible "N-rays" emanating from Earth disturb mental functioning, but this newly discovered force cannot yet be measured. Not only that, but the effects are sporadic and influence different people in different ways, so they cannot be readily documented. The essential requirement of falsifiability can be introduced and most students will understand why a claim that cannot be falsified is worthless.

R—Role of the claimant: Who is making the claim and is there something in it for them, e.g., money, fame, power, influence, publicity? If the public accepts the claim, will the claimant profit? Does the claimant appear to be an unbiased observer or a "true believer" with something to sell? Might he or she be motivated to slant things in a specific direction for personal benefit? Some years ago Roger Smith, then president of General Motors, claimed on the *Donahue* show that GM manufactured the "highest quality vehicles produced in the world." Might viewers have reason to hesitate in taking his word for it? If there *is* some benefit for the claimant, that does not necessarily demonstrate the claim to be false, but it certainly suggests using vigilance and caution in accepting that individual as a reliable fount of knowledge.

I—Information backing the claim: What evidence is offered in support of the claim? Is it public information that can readily be verified? Or is it anecdotal or testimonial? GM's Roger Smith supported his *Donahue* show claim about world-beating quality by pulling a letter from his pocket and reading it aloud. The letter was purportedly received from a happy Buick owner who described driving his car more than 300,000 trouble-free miles. The common uncritical use of testimonials and anecdotal evidence in the media and in advertising can be discussed here, along with why such use

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should always raise a red flag. We can also question whether the information cited is genuine, who actually provided it, and for what purpose? For example, how could *Donahue*'s viewers know for certain whether or not the Buick owner's letter was genuine? Finally, are we being provided with information that was obtained under scientific, controlled conditions and published in recognized peer-reviewed scientific journals, and why is that important?

During three decades of teaching college psychology courses I devised a practical system of applied critical thought based upon the easy-to-remember acronym CRITIC.

T—Test: If there is some reason to doubt the claim, how might we design an adequate test? What would provide rigorous conditions that preclude uncontrolled variables, systematic error, or cheating from biasing the results? What is required to conclude that a claim is probably true beyond a reasonable doubt and what *is* reasonable doubt? The basic ideas of statistical analysis, probability, and significance can be introduced here, along with some introductory concepts of experimental design. (Beware of sudden student brain-lock when instructors begin waxing poetic about statistics and research methodology.)

I—Independent testing: Has any *unbiased* source actually carried out a rigorous independent test of the claim and published the results, ideally in a reputable, peer-reviewed research journal? Does it back up the claimant? If independent tests have failed to confirm the claim, was this reported by the claimant? If not, why not? Considering the General Motors quality question, a check of *Consumer Reports*'s yearly survey of automobile owners' experiences would provide some quick, relatively unbiased data. Does it come as any surprise that Roger Smith never mentioned *Consumer Reports* when singing GM's praise to *Donahue*'s 8 million viewers? I wonder why?

C—Cause proposed: What is held out as a causal explanation for the claim and is it consistent with the physical laws of the universe? (It is not suggested that students can instantly make that judgment—rather, they are alerted to this being an important question that could be pursued, e.g., by asking a reputable astronomer, physicist or biologist.) For example, could there be something special about GM's assembly line, quality control system, or workers' contract that might result in better vehicles? Perhaps, and each of these causal hypotheses is something that could be examined. But what if the proposed cause transcends the laws of physics and proposes the existence of a completely new and mysterious force or energy? What if the claim is that "General Motors has discovered a way to focus N-rays to specially harden and strengthen the metal and plastic used in all its vehicles?" If a new force or energy is proposed it is not necessarily impossible, but must be considered highly suspect and demands especially rigorous proof before being taken seriously ("extraordinary claims demand extraordinary evidence"). Often with claims about paranormal events the possible causal mechanism is simply ignored or shrugged off as something wonderful but totally unknown. This is the case when astrologers say "We don't know how the movement of the planets affects human lives, it just does." Claimed events that suggest no feasible explanation are unlikely to be true (this provides an opportunity to discuss Occam's razor).

Applying CRITIC

After outlining this CRITIC system for my students we then apply it to a variety of widely accepted claims such as those made by astrologers, mind readers, faith healers, and New Age practitioners, each accompanied by an illustrative, entertaining video example lifted from the electronic media. I encourage students to consider not whether their instructor or psychologists in general accept what is being presented, but rather how *they* might approach the question critically and answer it for themselves.

For students willing to try applying their CRITIC acronym skills in exchange for some extra credit, I developed a simple essay questionnaire to be filled out after reading a feature article in the SKEPTICAL INQUIRER at the college library. The questions on the report correspond to the CRITIC acronym. For example:

> 1. What is the *claim* being considered? (The student responds with a written answer: "Training in Yogic flying can allow a person to hover above the ground or move around freely in space. The training involves. . .")
> 2. Describe the apparent *role* of the person, group or organization making the claim: (etc.)

This written exercise lets them practice applying critical thinking and has the added benefit of giving most students their first exposure to the pages of the SKEPTICAL INQUIRER. The ultimate goal of the CRITIC acronym is to nudge students toward application of a more systematic and scientific approach to the fascinating world around them . . . as an alternative to the impressionistic, faith-based, and often authoritarian approaches that have been foisted upon them all their lives. A study involving 130 introductory psychology students found that those who had experienced the CRITIC-based course introduction were indeed more skeptical and likely to use the CRITIC terminology when evaluating controversial claims at semester's end than were students who did not receive CRITIC training ($p < .001$).

Acknowledgment

My thanks to Richard Rasor, Bud Gallagher, and Bob Tallmon for their assistance in the study mentioned at the conclusion of this article. □

Skepticism Under the Big Sky

If you offer it, they will come! Since 1996, four intrepid prairie skeptics have annually pitted approximately a quarter century of graduate study in science, medicine, and education against the claims, cunning, and innocent convictions of local truth seekers.

MIKE SCHWINDEN, DAVE ENGBRECHT, JOHN MERCER, and MARK PETERSON

Motivated by a desire to promote an entertaining, yet more critical examination of popular scientific and medical claims (especially by senior citizens), we offered a ten-week course titled "Investigating the Fringes of Science and Medicine." The course was held through the public school district's Adult Education Program four times in the past five years. Here are some highlights.

Day One/Year One

Wearing an assortment of surgical garb, crystals, and tie-dyed lab coats, the four of us strolled into the classroom to the inviting voice of Mary Chapin Carpenter singing, "I Feel Lucky." During our introductions, one of John's scientific colleagues (who looks more like a truck driver than a

scientist) rushed in, shouted at John, and stabbed him with a cardboard knife—spurting fake blood all over John's shirt. The assailant vanished as quickly as he came. After a long fifteen seconds, John stood up (to the palpable relief of many!). Next, we asked the students to write down what they had seen and heard. We collected and shared the wildly disparate accounts, making an important point: that reliable people do not necessarily make reliable witnesses.

As an icebreaker, we asked for volunteers to share any strange or mysterious phenomena they had personally experienced. The students numbered about forty-five; ages ranged from two female friends in their early twenties to several married couples in their late sixties; backgrounds included nursing, farming, government workers, homemakers, pharmacy, and several retirees; a few came as skeptics, though most came predisposed to believe claims of the paranormal. A brave and bubbly woman of fifty rose to the challenge. "I'll tell you one," she chirped. "Oh, you've all had it happen—the phone rings and before you pick it up, you know who it is." So who needs Caller ID?

We thanked her for volunteering. The floodgates were open. Most of our adults, it seemed, had experienced something unusual or bizarre. A woman in her early forties recalled, "One time, oh, this is so strange, I was meditating in my living room. Suddenly, I looked down and realized I was floating two feet in the air. Then the carpet turned into sand as I stared down in disbelief." We resisted the urge to suggest that perhaps she had merely dozed off. Nevertheless, we thanked her for contributing; relationships based on mutual trust and respect were being established. There would be plenty of time for alternative explanations.

Over the next nine weeks, we discussed a multitude of paranormal, pseudoscientific, and fringe medicine topics—many of which were derived from twenty-five years of back issues of SKEPTICAL INQUIRER or *How We Know What Isn't So* by Thomas Gilovich.

Because we knew that active participation was crucial for maintaining the students' interest, we tried to budget time for frequent hands-on psychic experiments. For example, one of us would run through a deck of Zener cards, pressing the small cards against his forehead and squinting mightily for effect while the students wrote down their predictions on their own scorecard. Afterward, we would console the inevitable post-exercise "I-hoped-I-was-psychic" depression with an optimistic "this doesn't prove you aren't psychic—maybe next time!"

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Do You See What I See?

One night we discussed the paranormal phenomena of ESP and mental telepathy and invited the class to participate in a casual experiment. We paired off couples to act as senders and receivers and reserved five students to serve as judges. The senders blindly selected one picture from a box of pictures clipped from magazines. They were directed to various isolated nooks and closets of the building where they were to sit down, concentrate, and send an image of their picture to their receiving counterpart—who drew what he or she had received telepathically. (Critics may point out that with all those psychic signals crossing as they passed through the building, it is no surprise that the extrasensory effect disappeared!)

Pictures and drawings were shuffled, labeled, and set out for the judges to match up. The hit rate was a whopping zero. There were some interesting sidebars to this activity, however. One receiver finished her drawing (of a crude bird) and said, "I had the strongest image of trees and mountains." Of course they weren't strong enough for her to draw them, but she was inadvertently giving her team extra chances for a hit. Unfortunately for her, her husband had telepathically sent her an image of a man on a camel in a treeless desert.

Another intriguing reaction came from a woman (receiver) who had drawn nothing more than a simple triangle. Her sender had sent her an image of a man holding a large fish. The judges had failed to make a connection, but as she studied her drawing and the picture, she suddenly observed that the fisherman's arms formed sort of a triangle with the fish as the base. She tried to appeal the judges' decision!

Finally, there was the woman who noticed that the back side of the picture her boyfriend was looking at actually resembled her drawing. She wondered if maybe she accidentally received the flip side image! One year, we had concluded the telepathic viewing activity and were at least thirty minutes into the next topic. All at once we realized sweet, gray-haired Edna was missing. A quick search through the building revealed Edna sitting patiently in a closet, serenely continuing to send her giant tortoise image to her roommate who was too shy to let us know that her sender had not returned.

You Can Lead an Old Dowser to Gold

Two years ago, we were delighted by the attendance of a very opinionated, very outspoken, elderly gentleman dowser (we'll call him Clyde). Clyde was learned in every pseudoscientific subject we would bring up, but his passion was for dowsing. He insisted that his dowsing rods had diagnosed his wife's medical condition when her doctors couldn't. He said they could be used to find lost objects when held over a map although he had not yet been able to locate his own missing bicycle. This he attributed to his inexperience with the rods—he had no doubt that a professional dowser would have been successful by now.

It took very little coaxing to get Clyde to bring his dowsing rods to the next class. That night he proudly held the L-shaped dowsing rods up to some volunteers' faces and showed how the rods moved away in response to the strength of their auras. He

let the instructors try. We were able to reproduce the aura effect; however, we said we were causing it to happen by slight movements of our wrists. Clyde was unimpressed. He interpreted this as further evidence for a dowsing effect—we skeptics were merely denying our gifts! Eventually Clyde asked to be put to the test. He said the rods could determine which hand held Mike's gold wedding band. He had a 50/50 chance and we almost hoped this kindly man would be successful—he wasn't. That darn shyness effect appeared once again (or maybe Mike needs a new jeweler!).

Gerald Fried

Each year we explained the "basics" of numerology—with a twist. We gave the students the personality profiles associated with each number (with all reference to the number removed). Students were told to review the profiles and initial the one that most accurately described them. Only then were they told which profile is associated with which number. The results were predictable—except for the night when a numerology expert, familiar with the profiles, nailed it. She was quick to add that street addresses also give accurate personality profiles of houses—to the enlightened!

We used the same "decide *before* you know" strategy with horoscopes, personality-based blood-typing, and I Ching. The results were again predictable. Some simple probability math helped most of the students appreciate that chance could account for the occasional successes.

We always took advantage of the fact that our students had seen the movie *Jurassic Park*. The movie story about preserved and re-animated dinosaur DNA provided John an opportunity to demonstrate how difficult it is for the average person to determine when real science stops and fringe science begins. John explained that expecting a biologist to reconstruct a dinosaur from a few fragments of DNA is like asking an engineer to build a space shuttle given a few strands of wire and a piece of the tail fin.

To Guess or Not To Guess

One evening a middle-aged woman, Eileen, dared us to explain away the accurate predictions from her recent visit to a local psychic. Eileen credited the psychic with knowing she had relatives in Minnesota, predicting a trip to Missoula, and knowing her son had nosebleeds. Our exchange with Eileen went something like this:

Instructors: Tell us what she said about relatives in Minnesota.

Eileen: "I see you have relatives in either Minnesota or maybe it's Pennsylvania."

Instructors: (to the class) How many of you have relatives in either Minnesota or Pennsylvania? (Over half of the hands went up—not much of a surprise given the large Scandinavian population.) What did she say about Missoula?

Eileen: "I see you taking a trip to Missoula," and, in fact, a friend offered me a ride to Missoula two weeks later.

Instructors: Since the psychic didn't specify when the trip would take place, her prediction would have seemed accurate if you had gone months before her prediction or months afterwards. Furthermore, she probably knew you were a teacher (Eileen was a regular client). and since teachers are constantly going to the University of Montana (in Missoula) for additional coursework that seems like a pretty safe guess. Also consider that Missoula is the second largest city in the state, the closest "big city" shopping and medical care center, not to mention a popular recreation area. Given the scarcity of cities in Montana, your psychic could have predicted a trip to either one of the two most populous cities and probably scored a hit.

Eileen: Well, how do you account for the fact that she knew my son had nosebleeds?

Instructors: We aren't here to dispute her claim; however, remember that most kids have nosebleeds. Also, your son has allergies and if that information had come out in an earlier visit, the psychic would certainly have made a note of it. In this dry climate, kids with allergies are particularly susceptible to nosebleeds.

Medicine and Drugs

Fringe medicine always generated the most interest and excitement. Dave often began by reading the disclaimer found on herbal medicine pill bottles. After reading it verbatim, he paraphrased the manufacturer's words, "We make no promises regarding contents, quality, dosage, or concentration; there are no known benefits; you could have had a porterhouse steak with the money you wasted on these weeds." The pharmacist in the audience laughed the loudest.

It is probably safe to say that most people never have an opportunity to engage two physicians in an informal discussion about the universally fascinating topic of dying, so it was no surprise the subject came up on the night both Dave and Mark were in class. This provided our physicians an opportunity to graph the progression of a chronic illness and demonstrate how unscrupulous people can take advantage of these cycles to promote and peddle quack cures. It also gave them a chance to examine near-death experiences and brain chemistry.

Another popular medical theme was manipulation in its various forms: chiropractic, massage therapy, reflexology, and

Continued on page 63

Why Was *The X-Files* So Appealing?

The success of The X-Files *was in large part due to its expression of a confluence of three powerful, ancient, and legend-like beliefs—paranormalism, conspiratorial thinking, and populism.*

ERICH GOODE

The demise of *The X-Files* series cries out for an assessment of its appeal. In the volatile world of big-time television, a decade-long run is no small potatoes. Clearly, the show said something to audiences that most programs don't. What was The *X-Files*' special magic? What made it intriguing to tens of millions of viewers?

My sense is that the program's appeal was confluence of two immensely attractive and primordial ideas: paranormalism and conspiratorial thinking—along with a strain of populism, which often comes with paranormalism, and nearly always accompanies conspiracy theories.

The X-Files was not a documentary, of course—it was fiction. (At the same time, or so the show's producers

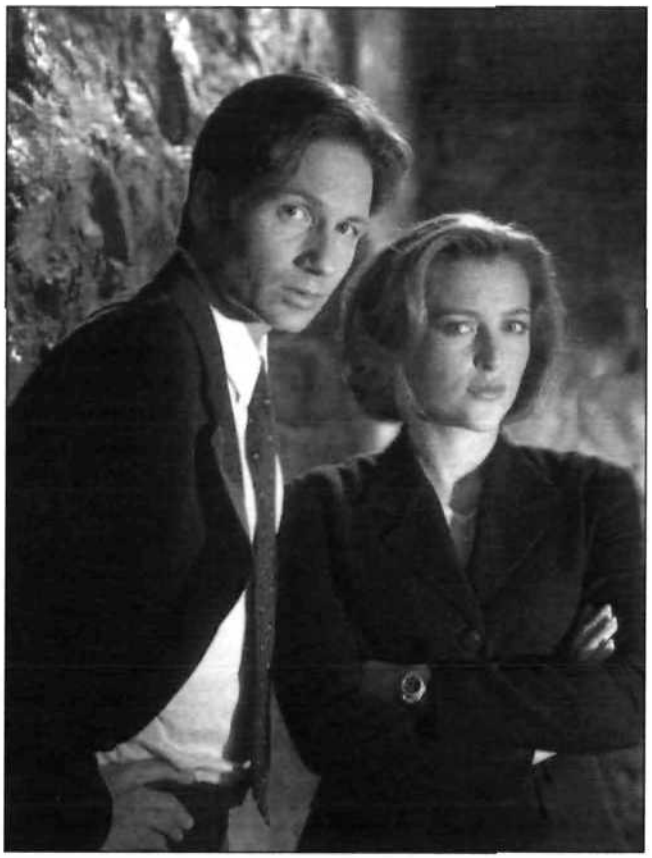
claimed, it was "inspired" by "documented accounts.") It didn't lecture to us a paranormalist or a conspiratorial (or a populist) point of view. In fact, my guess is, its creators and producers adopted a tongue-in-cheek attitude toward the occult events it depicted. For most of us, the events it depicted were just a bit *too* fantastical to be taken seriously as fact. [See also "*The X-Files* Meets the Skeptics," SKEPTICAL INQUIRER, January/February 1997.]

But the program did contrast a paranormal/conspiracy point of view (Agent Mulder's) with a more scientific or skeptical perspective (Agent Scully's)—and week after week, the skeptical perspective always lost. Moreover, viewers actually *saw* evidence of both paranormalism and conspiracies at work with their own eyes. We saw the aliens scuttling about in the shadows and we saw the Cigarette-Smoking Man and his cronies, also in shadowy places, conspiring to cover up evidence that the aliens are on our planet.

Spotting *The X-Files'* paranormal theme is a no-brainer. Not only were the words "paranormal activity" flashed on the screen in the program's opening credits, but throughout, Mulder's supernatural theories were always verified. When Scully told him that that the presence of aliens on Earth contradicts the laws of physics, Mulder replied, when it comes to aliens, "the laws of physics rarely apply." At another point, Scully, who is trained as a doctor, said: "I've always held science as sacred. I've always put my trust in accepted facts." Mulder had a different take on the matter: "Might we not," he asked, "turn to the fantastic as a possibility?" Week after week, the show overturned Scully's trust and validated Mulder's "possibility." No doubt about it: In *The X-Files*, traditional science was thrown out the window and paranormalism reigned supreme.

The X-Files was also a classic case of a conspiracy narrative. Conspiracy theories argue the following. First, treachery is afoot; somebody (or some*thing*) is trying to do harm. Second, not only do the conspirators want to do harm to others, they want to do harm to *us*— good, decent people. Third, the conspirators are organized; indeed, that's what conspiracies are all about. Fourth, their actions are secret and clandestine; the conspirators are very good at covering their tracks. And fifth, they are powerful; in fact, all conspiracy theories are *centrally* about the distribution of power, about monopolizing and withholding it (Fenster 1999).

Conspiracy theories are nearly always populist theories as well: They support and trust the common man and woman, especially, first, their view of things, and second, their right to power. Conspiracy theories and populism share a strong distrust of the elite, people in high places, the rich, the powerful, the well-connected—including scientists and other well-educated, pompous pundits. And, crucial for our understanding of *The X-Files*, most varieties of populism see science as symbolizing or representing *elitism*—that is, as contrary to the views and the interests of the common man and woman. Science is complicated and difficult to learn and superficially it seems to be monopolized by, and to support the interest of, the powers that be. Turning the tables on what most scientists think, the populist strain of conspiracy theories sees science as



David Duchovny (L) as Agent Fox Mulder and Gillian Anderson as Agent Dana Scully. ©1998 Fox Broadcasting Company. Credit: Mark Seliger/Fox.

traditional rather than revolutionary, conventional rather than going against the grain.

In conspiracy theories, the conspirators control public life by controlling access to valuable information. To fight against a conspiracy, we must first *believe* in it. And the central idea of conspiracy theories is that *we must uncover the truth*, which is what *The X-Files* is all about. As usual, Mulder said it best: "The answers are there. You just have to know where to look." In principle, by telling the truth, we can undermine the control that the powerful have over us. One of the things that makes *The X-Files* interesting is its ironic twist on this age-old theme. More on this momentarily.

There are many varieties of conspiracy theories. One major type is the paranormal conspiracy theory. What paranormal conspiracy theories share with conspiracy theories in general is the view that nothing is as it seems. There are evil, shadowy figures who hide valuable information from the public. In *The X-Files*, the conspirators constituted a multinational "consortium" that "represents certain global interests," which kept the truth from the rest of us. It was a conspiracy so vast that even the FBI was kind of a pawn, a puppet, a middleman between these

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powerful forces and the public. The valuable information in this case was of a paranormal nature—that extraterrestrials are here, they are here as a result of violating the laws of physics, and they mean to do harm to us by colonizing our bodies.

In the paranormal conspiracy theory, the underdog tries to reveal the truth about scientifically unexplainable phenomena and undermine, and ultimately defeat, the dominant, establishment view, thereby empowering the public. The underdog is opposed to a "rigid scientific view of the world." In place of this rigid view, the anti-conspiracy theory favors intuition, what feels right, what seems right, experience, memory—in short, what contradicts or can't be explained by science.

In such paranormal narratives, there is usually a believer and a skeptic, and the tension of the narrative is introduced in the debate between them. We want to be there to witness its resolution, that is, the manifestation of the truth of paranormal powers. The believer has usually seen evidence of paranormal powers with his or her own eyes, but either can't get his or her hands on hard, physical evidence, or the evidence keeps being stolen or destroyed by others, usually the conspirators. In contrast, the skeptic has faith in traditional science, trusts hard evidence, and thus debunks the paranormal point of view. One fascinating feature of *The X-Files* is that week after week, Agent Scully, a physician, an extremely intelligent woman, never quite comes to accept Mulder's paranormal and conspiracy beliefs.

Most commonly, the believer is a powerless, marginal person and often a woman; the skeptic is almost always a man (Hess 1993). In *The X-Files* these sex roles are reversed because the screenwriter and creator, Chris Carter, explicitly stated that he wanted to "flip" traditional sex stereotypes and make Mulder the believer and Scully the skeptic.

So, the populist, paranormalist, and conspiracy elements in *The X-Files* are expressed by: first, an anti-scientific viewpoint, that is, the view that traditional, established science is wrong, the laws of physics *can* be overturned, and the intuition of the common man and woman is right; second, a condemnation of government secrecy—it is opposed to the fact that the powers that be are withholding valuable information from the public and are harming us;

Turning the tables on what most scientists think, the populist strain of conspiracy theories sees science as traditional rather than revolutionary, conventional rather *than going against the grain.*

and third, the hero, the outsider, the paranormal believer, discovers evidence that contradicts the official, dominant view, and attempts to unmask the conspiracy and empower the powerless, the common man and woman, by giving us this valuable information.

Of course, in *The X-Files*, the conspiracy couldn't really be unmasked and the treachery couldn't be defeated because it was an ongoing series and hence the same evil forces had to continue to do their machinations in episode after episode. There *was* no triumph, no resolution. The only triumph was the reality of the evidence that Mulder and Scully gathered. But, again, because the conspirators were so powerful and commanded such a huge arsenal of resources, that evidence had to be destroyed or taken away; hence, the triumph of getting their hands on the evidence was negated. The only true victory in *The X-Files* was the viewers' knowledge of what really happened.

As a result, the triumph of the paranormal and conspiratorial views in *The X-Files* was only an *intellectual* and *cognitive* victory—not a political one. At the end of each show, the evil remained; only our view of the world changed. *We* know the truth, but the evil in our midst, it seems, will always abide.

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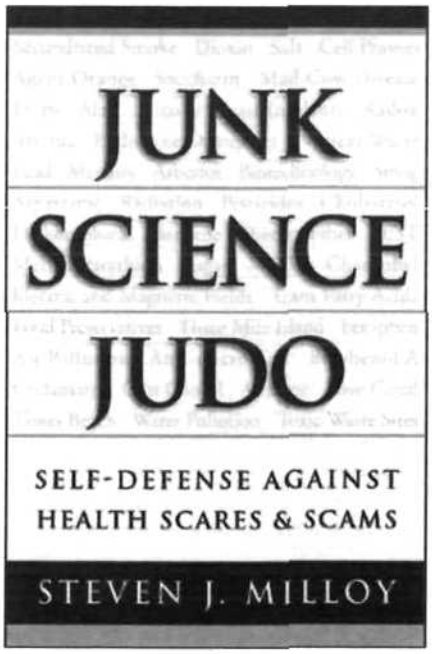
A Blunderbus Approach to Criticism of Statistics

TERENCE HINES

Junk Science Judo. By Steven J. Milloy. CATO Institute, 2001. ISBN 1-930865-12-0. 215 pp. Hardcover, $18.95.

Junk Science Judo is an annoying and shallow book that will not provide the reader with anything like a full account of the problems with junk science and the means to combat it. The author discusses some of the usual outrages of the health hysteria mongers such as claims that cell phones cause brain cancer and that Alar was a carcinogen. But the book is oddly incomplete in this regard. Missing is any coverage of the claims that power lines cause cancer or that breast implants result in immune diseases. These are two of the clearest cases of hysteria-mongering, and their inclusion would have made the book much more compelling by giving crystal-clear examples of why the media-induced fears are unfounded. Oddly, the real target of this book seems to be a poorly defined boogeyman labeled "statistics." Certainly, sloppy use and interpretation of statistics is one of the major problems at the heart of unfounded health fears. A book that would clearly explain the often subtle statistical errors made by promoters of health fears would be a valuable contribution. Unfortunately, this is not that book.

Milloy's crude broad-brush condemnation of statistics is nicely summed up by his oft-repeated phrase "statistics aren't science." This is like saying "tools aren't carpentry." True enough, but one is going to get damn little carpentry done without tools, even if tools can (duh!) be abused and used incorrectly. The real problem is that Milloy, as judged from his writing, simply doesn't understand statistical techniques well enough to be able to write cogent criticisms of the poor statistical techniques used to support various health scares. In most cases when he uses the term "statistics" he really means "correlations." For example, on page 59 he states, "No study that reports only *statistical* results can prove a cause-and-effect relationship" (emphasis added). This is a simply absurd statement and would never be made by an author who had even a basic knowledge of statistical procedures. There is an entire class of statistical analyses, called inferential statistics, which are designed precisely to allow researchers to draw causal inferences. Milloy's comment would be true if he substituted "correlational" for "statistical." It is certainly true that the finding of a correlation (the term doesn't even appear in the book's index) between two variables does not allow one to conclude that there is a causal relationship between the two correlated variables. But Milloy's ignorance of this fundamental difference between correlations and inferential statistics renders his argument confusing, to say the least.



At other times, Milloy uses the term "statistics" in slightly different ways. While he never discusses what inferential statistics are, and how they can be used properly to draw conclusions, he does discuss (in chapter 6) the concept of statistical significance and *p* values. A *p* value is a probability value ranging from 0 to 1 that gives the probability of the obtained result being due to chance. The *higher* the *p* value, the *more* likely the obtained result is to have been the result of chance factors. Putting it the other way around, the *smaller* the *p* value, the *greater* the probability is that the results

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are not due to chance factors—that they are due to the factors manipulated in the experiment. By general agreement, a p value of .05 or less is accepted as a "significant" result. When discussing p values (p. 108) Milloy makes another absurd statement: "How researchers calculate the p-value is not important." This is like saying, going back to the tool and carpentry analogy, that it doesn't matter how a carpenter makes a hole in the wall—a bulldozer is as good as a skill saw. In fact, there are hundreds of different statistical procedures that can be used to calculate a p value. Deciding which one to use on a particular set of data is far from a trivial problem. It is a problem that those of us who teach statistics probably spend more time on in class than anything else. If you do use the wrong procedure, you'll get a p value that is simply wrong. And you will often be badly misled as to what your results really mean. I have found (Hines 1998, 2001) that using the wrong procedure to calculate a p value is very common in experiments that claim to support various pseudosciences.

Milloy's ignorance of the fundamental difference between correlations and inferential statistics renders his argument confusing.

The author's ignorance of the real nature of, and problems with, statistics time and again prevents him from making his arguments against various health scares as effective as they should be. In chapter 11, "Tricks Are for Kids," he discusses studies that claim to show that exposure to this or that substance causes cancer. A common procedure in such studies is to examine the relationship between exposure and the rate of numerous different types of cancers (or other ailments). When one, or maybe two, significant relationships are found, the "fact" that substance X "causes" cancer type Y is certified. This is the problem of multiple comparisons. If we accept a p value of .05 as indicating significance, we are also accepting that 5 percent of the time, a result will be "significant" simply by chance alone. So, if you look at the effects of exposure to, say, postage stamps on 120 different types of cancer even if postage stamps do not cause cancer, for 5 percent of the cancer types examined there will be a "significant" relationship. Now, of course, on average three of these relationships will show that postage stamp exposure increases the risks of the cancers and three will show that exposure decreases the risks. The decreased risk findings just never get any press. This sort of serious statistical blunder is especially serious in studies claiming to link power lines to various cancers and PCB pollution to developmental disorders (Hines 2002). But Milloy barely mentions this problem.

In another instance, Milloy simply seems not to have read the relevant literature. On page 118 he is properly critical of estimates of the economic costs of cigarette smoking by noting that the claims that "differences in medical expenditures between smokers and nonsmokers are due only to smoking" are "probably not true" due to other differences between smokers and nonsmokers. But those huge estimates of the economic "costs" of smoking can be criticized on much more serious grounds. Reports of smoking-related costs are just that—reports of the costs only. They do not take into account the cost savings that result from smoking. Unfortunately, us non-smokers aren't immortal. We're going to die of something. The fact is that lung cancer, the major fatal disease of smokers, kills you relatively young and relatively fast, and thus relatively cheaply. So smokers generally die at a time when they have lived a productive life but before they have a chance to develop many of the chronic and debilitating, to say nothing of extremely expensive, diseases of old age such as Alzheimer's disease. Dead smokers are also less likely collect social security payment and retirement benefits. The point is not that it is "good" that smoking kills people. The point is that any rational economic analysis of the effects of a behavior like smoking must take into account both the real costs and the real cost savings associated with the behavior. For example, a recent Dutch study (Barendregt et al. 1997) estimated that the lifetime average health care costs for smokers is $83,700 and for non-smokers $97,200.

The numerous serious flaws in the logic and coverage of this book render it essentially useless as a guide to the detection of junk science. This is a real shame as the book does contain interesting and important nuggets of information. I was unaware, for example, that in studies of the risks of secondhand smoke the EPA arbitrarily changed the p value for significance from .05 to .075, thereby shifting a finding of the risks from "non-significant" to "significant." It appears that secondhand smoke isn't a health risk—though in my view that doesn't mean smoking shouldn't be banned. Secondhand smoke is still annoying, and that is sufficient grounds for a ban—just as we would feel no compunction about banning drinkers at a bar from spitting part of their bourbon and water on the folks around them. As the book stands, it comes across as little more than an ill-thought-out temper tantrum against those damn "statistics."

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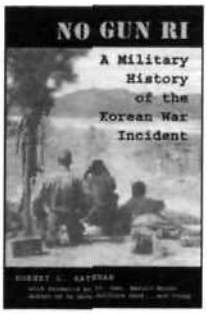


An Historian Debunks AP's Pulitzer Prize-Winning Story; An Exposé

ROBERT SKOLE

No Gun Ri—A Military History of the Korean War Incident. By Robert L. Bateman. Published by Stackpole Books, Mechanicsburg, PA 17055. 2002. 302 pp., $22.95, hardcover.

No Gun Ri—A Military History of the Korean War Incident should be read by every American who values honest media coverage. It should be a required textbook for every journalism school student—and an eye-opener for working reporters and editors.

This book, by historian and soldier Robert L. Bateman, thoroughly debunks the highly publicized Associated Press (AP) story, published in September 1999, that claimed U.S. troops "massacred" up to 400 civilians in the early days of the Korean War. In April 2000, the story won the Pulitzer Prize for investigative reporting. Although serious questions were raised shortly after about the accuracy of the story, AP has insisted its research, sources, and facts were accurate, and that hundreds of civilians were slaughtered at No Gun Ri on July 26, 1950, by troops of the 2nd Battalion, 7th Cavalry Regiment.

Robert Bateman's book, once and for all, presents solid, overwhelming evidence that the AP story was more than highly exaggerated. It was untrue.

In a new bizarre twist to the story, it has been revealed by Michael Taylor, a *San Francisco Chronicle* staff writer, that one of the three AP reporters made a shocking attempt to suppress Major Bateman's book before it was published. In an April 7, 2002, article, Taylor revealed that Charles Hanley late last year wrote a nine-page letter to Stackpole Books, the Pennsylvania publisher, saying it would be a "grave mistake" to publish Bateman's "diatribes and defamations." Taylor wrote, "A copy of the letter, filled with personal attacks against the author, was made available to *The Chronicle*."

Most journalists fight tooth and nail against any type of "prior restraint." Taylor wrote that Hanley's letter "is the kind of dark threat that gives free speech experts the chills." One can only conclude that Hanley was willing to violate basic American journalism ethics because he so greatly feared that Bateman's meticulous, painstaking research and analyses would completely demolish the AP story.

Major Bateman, an associate professor of history at the U.S. Military Academy at West Point, tells how the AP initiated and based its investigations primarily on fabrications of Edward Daily, a self-created "war hero." Daily recently pled guilty in Federal Court of being a war-veteran fraud and a swindler of over $400,000 in veteran's benefits. In Part Two of the book, entitled "The Story of the Story," Bateman describes the AP story and the leading role Daily played in it.

Bateman reveals that the AP shockingly ignored and never reported that there were seven war correspondents at No Gun Ri. Six were British or Australian, one was American—from AP, no less. None wrote a word, even in private notes, indicating they had seen such a thing as hundreds of bodies that would have been left from a massacre. They could not see any bodies, and no one ever has seen any, because there were none—a fact the AP story ignored.

There was little censorship during the Korean War, and certainly seven reporters—including one from AP and one from the highly respected *Times of London*—could not have been involved in a cover-up. Four of those reporters are still alive. According to a note Bateman sent this reviewer, they were outraged with the original AP "massacre" story—and shocked that nobody ever contacted them for their version when the story got worldwide attention.

Bateman thoroughly debunks the highly publicized Associated Press story that claimed U.S. troops "massacred" up to 400 civilians in the early days of the Korean War.

One minor fault of the book is that the original AP story should have been placed at the very beginning, so as to provide readers with an early reference, an opening gun, so to speak. Instead, the AP story is in the final chapter, which is aptly entitled "Making (Up) History." An appendix has the executive summary of the U.S. Government's investigation into the "massacre" allegations. The extensive investigation, ordered by President Clinton, clearly shows the tremendous publicity the AP story received.

As an old reporter, from the old school—an old school that insists on

Robert Skole is a reporter, author, and foreign correspondent. He has written for McGraw-Hill business and trade publications, including Business Week*; and his articles have appeared in* Esquire, *the* Washington Star, The Nation, Japan Times, *and in other publications in Florida, Massachusetts, and Europe.*

honest, accurate reporting—I cannot imagine how AP can avoid returning the Pulitzer, just as the *Washington Post* did some years ago when its prize-winning reporter was revealed to have written fiction instead of fact.

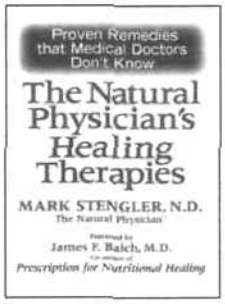
The AP's prize-winning "reporters" will have to live with themselves, and the naïve Pulitzer Committee will have to live with egg on its face.

And then there's NBC's Tom Brokaw, author of *The Greatest Generation.* As far as this reviewer knows, Brokaw has not acknowledged that he was totally conned, and he has not apologized to his millions of *Dateline NBC* viewers, for featuring "war hero" Edward Daily at No Gun Ri, boldly lying about how he machine-gunned civilians.

Only the AP reporters know why they did not warn Brokaw and other media people, and kept secret their suspicions, if not definite knowledge, that their famous "hero" was a fraud who was never at No Gun Ri. Obviously, if Daily were exposed as a con artist at that time, it would ruin AP's chances for a Pulitzer—not to mention raising really serious questions about the accuracy of the whole story.

Bateman's book is well footnoted and referenced, and includes detailed maps of the action at No Gun Ri. Bateman provides an excellent description of the months before the war, the communist guerrilla action in Korea, the poorly trained Cavalry troops going into battle, and the days and hours of the No Gun Ri incident.

After reading Robert Bateman's paragraph-by-paragraph, detail-by-detail debunking of the AP story, you'll surely take a new, critical, healthily skeptical view of today's journalism.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BERTRAM ROTHSCHILD

The Natural Physician's Healing Therapies. By Mark Stengler, N.D. Prentice Hall, 2001. ISBN 0-73520250-8. 562 pp. $30, hardcover.

This book is no doubt a boon to humankind. For those of you who are ill, chronically or acutely, this book will provide cures, yes *cures,* is the word author Stengler uses. It is a self-help book that advertises "proven remedies that medical doctors don't know." Here is a wonderland of solutions for your aches, disabilities, distressed mental states, and what-not. Stengler describes a multitude of illnesses which herbs, chemicals, homeopathic nostrums, acupuncture, etc. will fix. Stengler does not argue that sufferers should avoid seeing physicians (oops, that is ambiguous because he and others of his ilk are equally physicians, their degrees in naturopathic medicine), because his "cures" are complementary to standard medical practice. And, while one might disagree with my characterization of his remedies as cures, in the section entitled: "Quick Cure Finder: An A to Z Guide to Health Conditions and Therapies," he offers "cures" for 372 (more or less—you get the idea) health conditions. And each of the conditions usually has several treatments. Back pain can be "cured" with horse chestnut and *nux vomica.* Breast cancer is preventable with flaxseed and phytonutrients. Bronchitis has seven "cures" (astragalus; bromelain; cell salts; food sensitivity therapy; hydrotherapy; ipecacuanha; pulsatilla), and cancer has fourteen. Any sufferer would find great hope in his recommendations.

Well, perhaps although he boldly uses the word "cure" he means the word only in a manner of speaking. Surely, he does not mean to cure cancer, or macular degeneration, or anorexia, or colitis, or the multitude of "health conditions" with which we humans struggle. Perhaps he only means "feel better." We shall see.

Stengler has a distinguished history in the healing arts, with the doctorate in naturopathy (N.D.) and a certificate in homeopathic medicine, both from the National College of Naturopathic Medicine. He has trained as a general family practitioner and has "expertise" in nutrition, nutritional supplements, herbal therapy, and "many other modalities." Of great interest (though perhaps perplexing) is his membership on Yale University's Complementary Medicine Outcomes Research Project. He has achieved distinction as a writer and as a talk show host, and that he trademarked his self-chosen title, *The Natural Physician,* lends a sense of confidence to his pronouncements.

Clearly, this is a man of many parts who, by resume alone, we surely must take seriously. When he says in the body of this book that there is research that backs up an anecdote, we must accept that, although frequently he offers no reference. Homeopathic treatments are to be accepted on his say-so. He offers many anecdotes about how the treatments cured him and his patients, all with an aura of verisimilitude. Once he noted (in himself) the onset of the flu accompanied by a strong sense of fear. Deciding that anxiety is one symptom of the flu, he concluded that homeopathic aconite would cure the illness. Five minutes after ingesting the substance, he felt calmer and within a half-hour the other symptoms significantly diminished. At the end of the day, he was . . . cured. Yes, we should take him seriously.

Or should we? A boast of this book is that he provides references for the variety of treatments he recommends. That impresses, and I eagerly searched out the

Dr. Rothschild is a retired clinical psychologist.

proper section. Sure enough, there are forty pages of professional references, but upon examination, doubts emerge. For example, he suggests ginger root for arthritis, bloating and flatulence, cardiovascular disease, diarrhea, high cholesterol, morning sickness, motion sickness, nausea, and vomiting. For all these conditions, there are only four references, one from Chinese herbal medicine and the other three from standard medical journals. But those three deal with the same topic: the reduction of nausea. While ginger, he explains, reduces cholesterol in rats, it does not do the same for humans. But he does not mind recommending it; he says that if you take it for some other reason, who knows, it might help with cholesterol. Parting company with many of his herbalist colleagues, he does not believe that ginger can help arthritis, but also says, "It can be helpful to some people as part of a comprehensive herbal formula . . ." So, whatever the outcome, he is right.

About 28 percent of the references are from 1997 or later (my arbitrary cutoff for currency)—the rest are earlier than 1997, the oldest dating back to 1935. That means about 70 percent of the references are old without any suggestion of ongoing investigation. Some of the references have no citation, and some with citations have no year reported. Many of the journals cited are devoted to Chinese medicine or naturopathic medicine and many are from Europe. And many simply indicate that a study was done. For example: "One of the few studies on arsenicum album was done on rats that were given arsenic," or, "A study was done with forty people with chronic venous insufficiency . . . ," or "Researchers examined twenty-nine overweight individuals who also had a family history of diabetes." There are many such notes, giving the aura of research success but not providing even a hint of the findings. Many of the citations start with the line: "One study has shown . . ." Stengler does not inform the reader that basing a cure or treatment on one study is shaky. Positive findings have frequently failed upon replication, and sometimes there is a seesaw effect, so that to rely heavily on one study seems inappropriate. We have no way of knowing how many similar studies failed. One positive study amid several failures provides no useful information, no matter how provocative.

Thus, in spite of the references, he provides little useful evidence that his recommended "cures" will make any difference. Of course, people following his advice will get better—most illnesses are self-correcting.

To his credit, each treatment section includes a discussion of possible negative consequences. By happenstance, I saw my physician about tinnitus while working on this review. He told me that gingko biloba is sometimes useful, but advised against it because I also take warfarin. Stengler makes that point, so even if I had not searched it out I would have been adequately warned. (So much for his boast that ". . . medical doctors don't know.")

For whom is this book written? Physicians? Not too likely, though other health care providers might be enthusiastic about some of Stengler's claims. Scientists? Again, not likely. The readers of this magazine, with a skeptical bent and a sense of curiosity about claims? Nope. But, I know many more people, as we all do, who are more likely to find this book valuable than not.

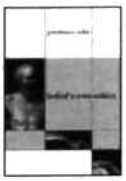
I suspect there are five factors involved with many people's enthusiasm for such "cures." One surely is that desperation drives the search for relief when medical doctors can offer only insufficient help. Another is that the use of such remedies provides a comfortable challenge to orthodoxy and "establishment" medicine; by their successful use, one feels like a winner. Another is word-of-mouth. A friend says: "I had the flu and aconite fixed me in one day." Who would not at least consider taking that "cure" in the face of ongoing discomfort? Another is that the use of such treatments provides a powerful sense of independence. One can find these nostrums in a variety of stores; what a sense of control one has to find the right treatment without authoritarian intervention. And finally, we have both ignorance of and hostility toward science. For many, scientific medicine is anathema.

It is plausible, even likely, that some of his recommendations are sensible, but we will not know because he, the proponent, has not thought it important to find out.

Finally, the question remains: Is this book dangerous? At one level, it is dangerous in the sense that people might try to "cure" themselves of illnesses when they would better see a physician. But worse, every day that passes means that the book has become more out of date. Stengler writes as if the research on prayer has definitely shown the validity of such intervention. But already this is no longer valid. Another example: gingko biloba, touted as a memory enhancer, has failed in current research, no better than glucose-spiked lemonade or attention arousing activities. Still lingering is the possibility it will help those with Alzheimer's disease; research continues. Whatever might have been reasonable upon the publication of this book will become superseded by more current findings; and potential dangers lurk in substances that currently seem safe. He offers no warning about this reality. One would be wise to get up-to-the-minute information from one's doctor.

What is sad about this book is that it is plausible, even likely, that some of his recommendations are sensible, but we will not know because he, the proponent, has not thought it important to find out. He cannot distinguish between anecdote and science, and that is a great failing. □

Listing does not preclude future review.



Belief's Own Ethics. **Jonathan E. Adler.** The MIT Press, 5 Cambridge Center, Cambridge, MA 02142-1493. 2002. ISBN 0-262-01192. 357 pp. $40, hardcover. A philosophy professor (Brooklyn College and CUNY) presents a new approach to the ethics of belief (what one ought to believe) based on the concept of belief itself rather than on the rationality of one's beliefs. In the traditional view of "evidentialism," the strength of one's beliefs should be proportionate to the evidence. Here Adler offers a strengthened version of evidentialism, arguing that the ethics of belief should be rooted in the concept of belief. He addresses such questions as irrational beliefs, reasonableness, control over beliefs, and whether justifying beliefs requires a foundation.

The Disinformation Cycle: Hoaxes, Delusions, Security Beliefs, and Compulsory Mediocrity. **William Harwood.** Xlibris Corporation, 1-888-7-XLIBRIS, www.Xlibris.com. 2001. ISBN 1-4010-4354-2. 277 pp. $18.69, softcover. Harwood's stated purpose "is to provide the maximum amount of information about which popular beliefs have been disproven in the minimum number of pages." He says he wanted "to make available to a wider audience information previously known only to persons with the relevant education and discrimination to recognize the qualitative difference between SKEPTICAL INQUIRER and *National Inquirer*." Avoiding voluminous detail, he refers readers to references in SKEPTICAL INQUIRER articles and various books. An outspoken Ph.D. scholar and a member of the editorial board of *Free Inquiry*, Harwood was also a publicist for three stage hypnotists, and he says hypnotism does not exist. In fact, he says he was a former adherent of "many of the beliefs I now recognize as indefensible." Short chapters range over such things as recovered memories, aliens, psychics, conspiracies, social-science pseudosciences, psychiatry, education doubletalk, disputes among religions, and much else.

The Genius Within: Discovering the Intelligence of Every Living Thing. **Frank T. Vertosick, Jr.** Harcourt, Inc., 525 B Street, Suite 1900, San Diego, CA 92101. 2002. ISBN 0-15-100551-6. 353 pp. $26, hardcover. A neurosurgeon and writer poses intriguing questions about how we as humans perceive intelligence—our own and other living organisms'. Defining intelligence as the general ability to store past experiences and to use that acquired knowledge to solve future problems, he rejects the notion that human intelligence is unique in the biological realm, or that it must be centered exclusively in the brain. In this examination of what he calls "brain chauvinism" he demonstrates how bacteria, immune systems, ant hills, even single cells all display intelligence in their struggles to survive in a changing world. And he argues that "bacterial populations don't mimic us, our brains mimic them."

The Ghost in the Universe: God in Light of Modern Science. **Taner Edis.** Prometheus Books, 59 John Glenn Drive, Amherst, NY 14228-2197. 2002. ISBN 1-57392-977-8. 330 pp. $29, hardcover. A physicist takes a fresh look at the age-old question of, Is there a God, or a spiritual reality beyond nature? He focuses on what we have learned about our world rather than on traditional metaphysical disputes. He uses the results of natural science to present a world where complexity, intelligence, and even the heights of religious experience emerge from what is ultimately material and random. While sympathetically criticizing Muslim and New Age perspectives as well as Jewish and Christian arguments, he argues that a thoroughgoing naturalism leads to a much better explanation of our world.

—Kendrick Frazier

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Oh Brother Luke, Where Art Thou?

KEN PAREJKO

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Robert Bly, *The Sibling Society*

I remember him as a bright, smiling, computer-savvy and seemingly ordinary college kid who turned his work in on time and cooperated with his friends on a Web page project. But it's not true that a person's eyes are windows into their souls. I had a friend once, long dead, years ago a fellow altar boy at our small rural Catholic church, who while County District Attorney was also a prime suspect in a murder over drugs. After that, when I shook his hand and looked into his eyes and laughed at his jokes I always wondered, Are you a murderer?

In a typical semester teaching biology at the University of Wisconsin-Stout I usually have close to two hundred students. I get to know a few very well, some only a little, most hardly at all. Luke Helder, arrested in May and charged with pipe bombings in several states (SI, July/August 2002, p. 5), was one of the latter. While I can recall him in the Environmental Science class, and have a pretty good idea where he regularly sat, I cannot attach anything particularly memorable to him.

When Luke's manifesto to the *Badger Herald* in Madison became available on the Web I hurried to read it, with some apprehension. Would he, through some colossal misunderstanding of something I'd said in class, name me as the person who sent him down the street of no-return toward domestic terrorism? Was I in some way, large or small, responsible for the pain and suffering he'd caused, and was himself enduring? In fact I didn't find much of myself in his manifesto, only a bit in the few sentences condemning us all for mistreating the earth—and for our greed and materialism.

Most (though certainly not all) of the students I have in my classes are remarkably fine people, polite, ready to learn, who care about each other, the nation, and the earth we live on. The chance to interact with them, at whatever level, is one of the pleasures of an academic career. For those of us in state universities it certainly isn't the pay. At least until the recent collapse of the dot-coms, bachelors of science in applied math at our university were graduating and starting out earning average salaries greater than I was being paid, with a Ph.D. and ten years college teaching experience.

During classtime, as other academics are likely to attest, a lecture-room full of students is a living, breathing but mostly opaque creature. They're usually reticent, unsure of themselves, hesitant to get involved in a discussion. So I test the waters now and then with a little joke. When they laugh appropriately, I know they're there in more than just body. But for many of us there is little

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opportunity to have the kind of one-on-one interaction that would let you know, as a teacher, what they make of you and your class.

I'm saddened by these events, sorry for the people who were hurt; all those who were afraid to get or deliver mail; as father of two young men myself, deeply sorry for his parents; and sad too for a bright, smiling ordinary college kid gone bad enough, it seems, to spend a good part of his coming life in prison.

Can I explain it? Not any more than anyone can explain how Ted Kascynski, Timothy McVeigh, the perpetrators of Columbine, or Do (of Heaven's Gate fame) ended up as they did. Since Luke has gotten the attention he asked for (though I think not of the kind he wanted), there will be explanations.

As a scientist I too want to understand, to explain. Though I know it's easier to understand how DNA or an ecosystem works than what motivates people, still I try. Though I didn't know Luke that well, he seems to have come from a caring home town and family. My explanations are more distal—aimed at the amorphous society which is America at the beginning of the millennium, in which Luke lived, like a fish in water. I know that the more distal the explanation, the weaker the inferences it relies on; but still, I try.

Luke's confused "manifesto" helps. In it I find echoes from two thousand years ago, when in the deserts of Judea a charismatic preacher attracted a great following. This preacher claimed to be Son of God, then God Himself. Yet when Simon Magus followed his own logic far enough, he became unbalanced, and in claiming to be God, no longer had limits to what he could or should do. As Luke Helder put it: "You are your own god!" and "You can do anything you want." Again: "As you all begin to realize the potential you have as a consciousness/soul/spirit, you will begin to harness the abilities you have to produce realities . . . mentally, and physically, you produce your own reality."

This trap that Simon Magus, Luke Helder, and many others today have fallen into is called solipsism and it has, unfortunately, a long lineage. It is the mistake of thinking we each are the separate creators of the universe. It is the lie a disempowered people tell themselves to pretend they are powerful. It has been a predominate theme in New Age thought, and is popular because it questions the authority of scientists like myself who protest that there actually is a physical reality of which I am only part, and not the creator. This physical reality demands my respect and a certain conformity. Solipsism on the other hand is an in-your-face attitude, popular in an in-your-face American pop culture.

"Now wouldn't it be wise to question authority?" Luke asks in his manifesto. Who has lived through the Sixties and does not know that phrase by heart: "Question authority!" But wait. That sentiment, too, is millennia old, for we find St. Paul himself saying "I will destroy the wisdom of the wise, and set at naught the cleverness of the clever" (I Corin. 1.19.) But when all authority is questioned, the wisdom of the wise and the cleverness of the clever facilely discarded before they are even understood, the only remaining authority is the self, and the result is a sad collapse into a hermetic narcissism.

We are from our birth as a nation a culture of rebels. Our continuing distrust of government is the basis of a thousand conspiracy theories which flood the Web with useless words: a true democracy in which anyone's ideas, no matter how untested or unverifiable, how dangerous or demented, are apparently equal to those of all others. In fact, the government conspiracy Luke Helder alludes to is eerily reminiscent of the following, still on the Web: "To us, the most obvious infringement is upon the freedoms of the individual by the governments of the world. The strongest government and the one that acts the most righteous is the USA" (from the "Earth Exit Statement" of Chkody, one of the Heaven's Gate suicides).

As Robert Bly says in his book *The Sibling Society*, "In many ways we are now living in a culture run by half-adults." By honoring his inner adolescent, Bill Clinton showed how half-adult he was. It seems to be that our boys and young men are suffering the most, and strike out in confused anger. The patriarchy (from Aristotle to Thomas Jefferson) has been demeaned and discarded, only to be replaced by Kurt Cobain and Snoop Doggy Dogg. Is this not cause for worry, that men who have barely come to know themselves or the world, and often relate to it through an angry drug-induced haze, have become for so many the new cultural icons, the new authorities?

Luke, you share with Simon Magus a kind of messianism. "I'm at an advantage in this society, and so is every other spiritually well-rounded person. We understand," you wrote. This messianism is rooted in the belief that as self-actualized gods we each have the right and the ability to completely change the world. This Bly describes as "a deep insult" to the dead, who prepared the world for us, and from whom we rent it but for a little time. In a culture of solipsistic narcissism, essentially amoral and horizontal, and without the verticality of a cultural tradition, Luke Helder is, it seems, inevitable.

No, Luke, "The kids who get the 'A's' are not the only 'smart' kids." But your term paper, turned in not to me but to the whole world to read, evidences a strikingly deep irrationality. On the one hand you say "Treat others how you want to be treated . . . this mentality can only produce more positive emotion/love," then admit to ". . . dismissing a few individuals from reality, to change all of you for the better, surely you can understand my logic." This is ironically the logic of a deep conformer, who like the rest of our pop culture, believes far too much in itself and sets no limits to what it can or should do.

If in fact I could "do anything I want," I would take you aside as the class was shuffling out of the room, and

ask you how you were, Luke, and if you cared to have a soda or cup of coffee. I'd probe your mind and heart, as much as you'd let me, and maybe I'd uncover the key to your confusion and lay it on the table so we could both see it, and we'd spend some time, however much time it took, until you understood that though you cared so much for the rest of us, you were only a young man, whose adolescent "insights" into how the world works were as puerile as your belief that by hurting a few you could save the rest of us.

It is our enduring dream, as academics, that we change the course of our students' lives for the better, and in so doing, make the world a bit of a better place. We intervene when students show evidence of confusion, stress, or depression. But you seemed so happy, so adjusted, that I saw no reason to intervene. Unfortunately, your self-satisfaction was ill-placed, your "adjustment" only mirroring our facile societal superficiality. We have become a feel-good smiley-faced culture; it is said you wished to draw a smiley-face, with the geography of terror, across the middle of the nation. I do not share your conviction that "everything will be perfect in the end." Perhaps in time, which I suspect will come to lay heavily upon you, you may come to share my doubts.

Meanwhile I am left with the emptiness that comes from a missed opportunity, which I promise myself to transform into a renewed vigilance, futile as it might be, to try against all odds to prevent the inevitable. Which of us, I sometimes wonder, is the more delusional? □

American Schools: How They Measure Up

DONNA M. BROWN

The myth that American education fails generally in international comparisons is balderdash.

—Berliner and Biddle (1995, 63)

For the past several decades, the American public has been bombarded with bad news about schools. Confronted with statistics supplied by government agencies, international committees, and watchdog groups, many Americans have come to believe that the schools their children attend are inferior to those in other nations. This belief and others have formed the basis for a widespread educational reform movement that is in the process of introducing sweeping changes in the curricula of school districts across the country. Before we go any further in fixing what may not be broken, it is time to start examining some of the claims made about the alleged deficiencies of American schools and of American youth

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as compared to their peers in other countries. In doing so, we will find that many such claims are oversimplified and misleading. The fact is that while American youth may learn *differently* than students in other countries, the end result is that *adults* in America may be among the most knowledgeable, skilled, and educated in the world.

To make a valid comparison between two groups, the groups must be similar in every respect except the variable being considered. Thus, to fairly compare the performance of American students on a particular subject test with that of their counterparts in Europe or Asia, analysts should ensure that the two groups are similar in all respects except the country in which they reside. However, there are numerous factors that distinguish American students and their schools from their counterparts in other countries, including the following:

- typical American middle schools and high schools serve all students in their geographic district, whereas the schools to which they are compared in other countries tend to select only students who are most advantaged and academically talented;
- American students and their European and Asian counterparts often study the same subject matter at different ages; and
- cultural values in America uniquely impact how American students spend their time in school.

Without taking these factors into consideration, it is not possible to draw meaningful conclusions from single-point data comparing student performance on subject-area tests.

In countries to which the U.S. is often compared in terms of academic achievement, students are identified early as being on a vocational or academic track, and only those most academically capable proceed to the *gymnasia*, where higher-level academic skills are taught. Comprehensive tests at the end of each school year determine whether students have mastered subject matter well enough to continue to the next level (Berliner and Biddle 1995, 52, 54). Those who do not generally leave school take a job or are placed in an apprenticeship. Those who succeed and remain in school are students who, in the United States, would be taking the most rigorous, academically challenging honors or Advanced Placement classes.

In the U.S., students who have handicaps that affect their learning, who achieve below grade level, and who are learning English as a second language are served in the same schools as the most academically talented students. All these students are included in most state and national achievement tests, and their composite scores are often compared to much more homogeneous groups of high achievers in other countries. The results must necessarily range from meaningless to dangerously misleading.

One result of the heterogeneous nature of American secondary schools is that they tend to offer a range of classes in each subject area so as to meet the needs of students with various capabilities. Thus, ninth grade students in English in the same school may be taking, according to their abilities, honors English, a language skills-building or remedial English course, a "sheltered" English class for emerging English speakers, or an English as a Second Language class for newly arrived immigrants. Similarly, students in ninth grade mathematics may take courses ranging from remedial or "basic" mathematics to geometry to second-year honors algebra. American schools, recognizing that readiness to learn in any given subject area varies according to individual circumstances, provide subject matter appropriate for a wide range of abilities.

Although fewer students in a typical American public school are taking the highest-level courses, American students tend to stay in school longer than their European or Asian counterparts and eventually master the more advanced materials. The U.S. ranks among the highest countries in the world in the percentage of seventeen-year-olds enrolled in school and *first* in the percentage of students who will pursue post-secondary studies and of students who will eventually attain a bachelor's degree (Huelskamp 1993, 3). [See also "Perspectives on Education in America: Sandia Study Challenges Misconceptions," SKEPTICAL INQUIRER, Fall 1993.] Thus, studies that compare only same-age students from different countries in their knowledge of a subject are essentially meaningless. Because American students often study the same curricula in different grades and at different ages, the only meaningful comparison would be between young adults who have completed their education (Berliner and Biddle 1995, 53).

American cultural attitudes and values have shaped educational curricula in the U.S. Americans are deeply committed to the concept of *breadth* of education and encourage their children to engage in sports, develop leadership skills through clubs and activities, contribute to their communities through youth groups, and have jobs so as to learn fiscal responsibility and management skills. Their same-age counterparts in the *gymnasia* of other countries are unlikely to engage in any of these activities, pressured as they are in highly competitive schools to maintain excellent grades. Berliner and Biddle (1993, 53) remark that by comparison, "at any given age American students are likely to be more broadly educated than are students elsewhere though they may not yet have as much detailed knowledge of specific academic subjects. They will acquire this knowledge over time, of course; and they should, on average, end up with a knowledge base that is uniquely broad as well as deep."

Perhaps it is time to stop believing everything we hear and read about the allegedly sorry state of American education.

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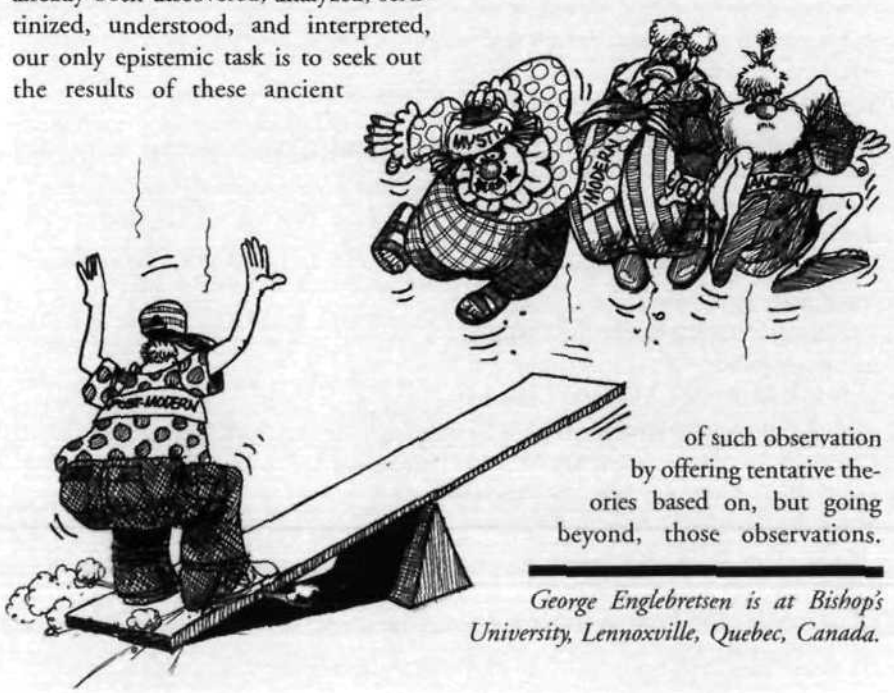
Déjà Vu: Descartes All Over Again

GEORGE ENGLEBRETSEN

Think of the times: academics and intellectuals of all kinds engaged in a bewildering array of paper debates and feuds concerning the questions of what is knowable and how it is known. It's a three-ring circus.

In the first ring: let's call them the Ancients. They tend to believe that whatever is worth knowing at all has been discovered and is now available to us. The things that are knowable (and worth knowing) concern such things as God, the fate of dead people, and the ultimate purpose of life. Since the truths about these and related things have already been discovered, analyzed, scrutinized, understood, and interpreted, our only epistemic task is to seek out the results of these ancient labors and accept them. And, of course, there are any number of sages lurking about ready (sometimes for quite modest tariffs) to provide the Truth. Sometimes learning these truths turns out to be life-altering; sometimes it's *to die for.*

In the center ring: the so-called Moderns. They tend to hold that there is a real world that is independent of us (of what we believe or say), and that it can be known. Moreover, they tend to believe the best way to know about the world is by slow, systematic, careful observation, and that we can make sense of such observation by offering tentative theories based on, but going beyond, those observations.



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They believe that we know (and, in fact, already know) much about the world, but there is far more left to know. We know, or aim at knowing, lots of truths about the world. However, none of these are to die for. We could be wrong. All of *our claims to know are revisable in light* of further observation or better theories. The Moderns are not Skeptics (who deny the possibility of knowledge altogether), then, but they are cautiously skeptical inquirers.

In the third ring: the Mystics. Like the Ancients and the Moderns, the Mystics are committed to the view that we can know. Moreover, they agree with the Moderns that we can know much about the world around us. But, with the Ancients, they accept that such knowledge can be something to die for. And *this is because the Mystic takes the* process of coming to such knowledge to be very different from the difficult one prescribed by the Moderns. For the Mystic knowledge is hermetic; it is a secret revealed to only those few who have what it takes. Of course, what it takes could be almost anything: access to a secret code hidden in an ancient text or in the stars or in the palm of your hand, a rare sixth sense that allows one to see auras or hear spirits or feel occult forces.

Those in the audience of this circus cannot help but notice that lot of work is going on in the center ring. There's lots of sweat. Progress is slow. There's

not much flash. Still those down in the ring seem to enjoy what they're doing, even if the audience doesn't. The audience does enjoy the antics in the other two rings; that's where the trapeze artists and the bare back riders are, the jugglers and the clowns. It's not a bad circus as circuses go. It is an old circus; it's been around for a very long time. It has come to our town before; it will come again. And it hasn't changed much—no matter how new it all seems to us children. Four hundred years ago it *was* pretty new. That was the age of Descartes, the ringmaster *par excellence* in the age when Modernism really was modern. The ringmaster, remember, is always in the center ring. There with him were Galileo, Boyle, Pascal, Hobbes, Gassendi, Maersenne, Leibniz, and the rest of the troupe, all dedicated, to one degree or another, to the notion that the world was a vast machine and that it could be understood with the help of observation and theory and explained in the language of mathematics. Finally, though Gassendi found it hard at times, most were careful to temper their skepticism, not wanting to be completely outside the tent (like those Skeptics Bayle and Montaigne).

The Ancient troupe was in its ring of course. William Harvey and Francis Bacon were stars here. These Ancients, more ancient than ours but still not literally ancient, saw the world not as a giant clockwork but as an organism. So Aristotle and Galen were the ancients whom the Ancients admired. While the Moderns were creating modern mathematics, physics, and astronomy, the Ancients were making modest advances in the older disciplines of biology and medicine.

Even though in Descartes's day much of the action was in the center ring, the Mystics in the third ring still commanded lots of attention. Continuing a hermetic tradition much older than themselves, these Mystics were, as mystics tend to be, fairly anti-intellectual, committed to the alchemic quest to turn lead into gold, and therefore, secretive about their doings. The stars of the third ring included Copernicus (the sun-worshiper), Paracelsus, Brahe, Bacon (who took leave now and then from the troupe of Ancients), and Kepler. But the brightest luminary among the Mystics was that mean, petty, little genius, Newton, who often played two rings simultaneously, leading the Moderns between stints at alchemy and Bible coding among the Mystics.

As I said, it's not a bad circus that we have today. It's an old circus; it's been around a very long time. It has come to our town before; it will come again. Of course, the next time it comes to town the changes we see may be greater than usual. There is a completely new troupe, put together and trained first in *le pays de Descartes*, but now touring college campuses in the New World. They aim to replace completely the Moderns in the center ring. They call themselves the Post-Moderns. And what do they have to say about the world out there and how we know it? Well, that all depends. At any rate, they will probably be wearing fright wigs, rubber noses, and big floppy shoes. □

SKEPTICISM UNDER THE BIG SKY

From page 47

therapeutic touch. Mark brought in a model spinal column and explained its parts and functions. He demonstrated how, with some of his chronic back pain sufferers, he administered injections of analgesic medicine near the site of the pain, thereby allowing the medication to saturate the enervated region. One woman was particularly incensed by this strategy. She said that chiropractors and massage therapists "go right to the spot" of the pain. She suggested that maybe doctors, instead of working near the spot should consider going right to the spot. She continued with her "spot" analysis for several minutes.

Whether Dave was explaining the real reasons (immunization, antibiotics, sterilization, etc.) people live longer or Mark was showing slides of early twentieth-century medical contraptions, these class sessions inevitably ended too quickly as far as the students were concerned. In addition to Dave and Mark's medical expertise, we made regular use of Stephen Barrett's wonderful Quackwatch Web site.

Getting Publicity

Enrollment in an adult education class is always an issue. We competed with sewing classes, painting workshops, investment seminars, and so on. Through our initiative, the local newspaper took our picture and ran an interest-generating story before our first class. No doubt this contributed to our record-setting first-year attendance. The second and third years, we didn't have a story (because, as my reporter friend explained, we were no longer new news) and our enrollment declined. The fourth year we decided on a new angle—we offered the class but with a $250 reward for evidence of psychic ability—we got our story, our picture, and our enrollment.

Mike had called Joe Nickell at the CSICOP office for advice before we went public with this monetary challenge. Joe cautioned us that he could easily fly in a magician who would take our money. Mike told Joe that if we got in a bind, we would call him, describe the situation, and have him bail us out! Joe laughed and agreed to help us if he could.

In the end, it's not at all clear how much healthy skepticism was imparted to our students. We answered some questions but raised more. We shed light on licensing, credentials, and expertise. We brought in experts from the pseudoscientific side and attempted to teach the students how to devise alternative explanations. We hope we gave the students the confidence to ask questions, examine evidence, and apply their reasoning skills. We do have anecdotal evidence that everyone had fun! □

FOLLOW-UP

After-Death Communications: A Misleading Critique

GARY E. SCHWARTZ

Wiseman and O'Keeffe (W/O) have extensively criticized (SKEPTICAL INQUIRER, November/December 2001) the paper on mediumship communication which my colleagues and I published in the peer-reviewed *Journal of the Society for Psychical Research* in January 2001. By a combination of selection of some and suppression of other facts they have succeeded in misleading SI readers, few of whom would have seen the original study recording the high degree of accuracy and replicability of after-death communications via five prominent mediums.

First, W/O fail to acknowledge the fact that we discussed as questions for future research many of the issues they raise, as though they had never been addressed by the experimenters. These were mainly questions of sensory leakage, judging bias and the use of an "inappropriate control group." But we made it clear that the purpose of the original experiment was not to preclude every possible source of sensory clues but to start by eliminating visual and much auditory feedback to the mediums (by allowing only yes/no responses from sitters), and then to progress to a protocol allowing as clues no more than subtle breathing, body movement, sighs, and possibly odors (the silent-sitter part of Study 2). That was simply a first step towards falsifying conventional sensory hypotheses, and this was clearly stated in the paper.

Could these remaining clues (e.g., breathing, chair movements) by concealed and unknown subjects explain how mediums could obtain 60–90 percent accuracy in giving specific names, initials and historical facts which apply to specific individuals? We are unaware of any scientific evidence that "cold reading" can do so where the subject is concealed and unknown and the medium denied verbal feedback. We would welcome such experiments.

Our paper stated that later research, employing long-distance readings where all visual, auditory or olfactory clues were eliminated, would be published in the October 2001 *JSPR*. It was. The results effectively answer the W/O criticisms. But SI readers were unaware of this, and were left with the impression that, far from being fully conscious of the importance of such precautions, we were ignorant or dismissive of them.

The aim of the first experiments was not to rule out possible judging bias but to minimize it. The sitters rated every item from their respective transcripts conservatively. They were required to justify each answer and provide validation where appropriate. Moreover the summary statistics were limited to the most definitive +3 ratings. Were they likely to forget or confuse the initials or names of their dead children or parents, or forget the causes of their deaths? True, double-blind procedures would eliminate any such bias, but W/O failed to mention that we had discussed precisely this kind of experimental design for future experiments—since successfully carried out. But in any case we are unaware of any evidence that rater bias has operated under even the less rigorous conditions described.

As for our "inappropriate control group," our aim was not perfection but simply to eliminate simple guesswork to explain the data: particularly important in the sitter-silent conditions. For that purpose the control group was not in the least inappropriate: simply a straightforward way of guessing by intelligent individuals.

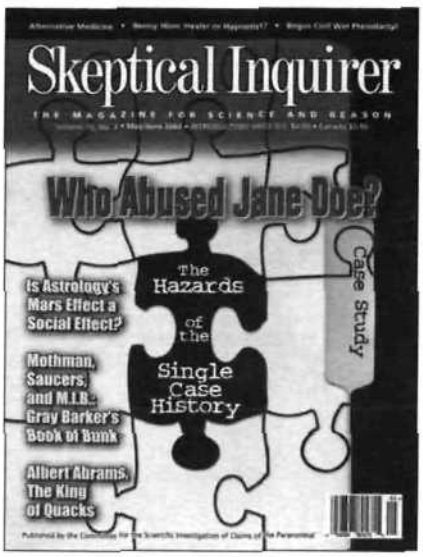
Wiseman and O'Keefe correctly point out that the greater the number of deceased relatives for the mediums to identify, the greater the likelihood of a chance explanation; but that applies equally to the simple-guessing control group. In any case this hypothetical concern can't explain that in Study 1, for example, all five mediums reported a deceased son; three reported the initial M; one the name Michael; three that the death was quick, and two reported or implied suicide by gunshot. Not only were all these answers both correct and ignored by W/O; they equally ignored the converse, i.e., that no medium reported a deceased daughter, or gave an incorrect initial for the son, or a name other than Michael, or suggested a different cause of death.

That is not only seriously misleading, it transgresses the rules of fair criticism that Ray Hyman and others have repeated. An example of selective quotation relates to the "once, twice, thrice" statement concerning the loss of children. Here W/O failed to mention that this medium then referred to a miscarriage which the sitter had kept secret from her husband, as well as the experimenters.

It is not responsible science for W/O to ignore data inconsistent with their criticisms. Skeptics have a duty to practice what they preach: even-handed skepticism.

Taking all the data together, the most parsimonious explanation to account for the largest amount of the data is currently the continuation of consciousness hypothesis, a conclusion, I might add, strongly supported by later experiments as evidenced in our second paper, of which W/O have offered no criticisms. □

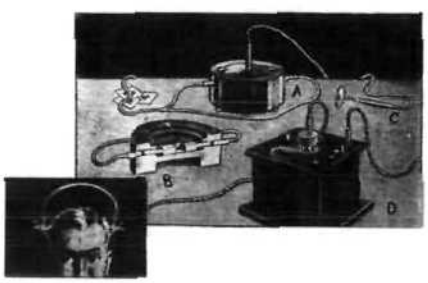
Wiseman has been invited to respond in a following issue. —Ed.


Skeptical Inquirer
THE MAGAZINE FOR SCIENCE AND REASON
Who Abused Jane Doe?
Case Study
The Hazards of the Single Case History
Is Astrology's Mars Effect a Social Effect?
Mothman, Saucers, and M.I.B.: Gray Barker's Book of Bunk
Albert Abrams, The King of Quacks

Albert Abrams, King of Quacks

As a supplement to your article on Dr. Albert Abrams ("The King of Quacks . . .," May/June 2002), the Bakken Library and Museum has a collection of Abrams manuscripts, including letters and blood samples. We also have one of the earliest oscilloclasts, many of its successors, and a fair collection of literature for them all. And while they may have been "the kind of devices a ten-year-old would build to fool an eight-year-old" I confess that they've done a decent job of exasperating and disheartening this physicist as well.

However, the instrument illustrated on page 47 does not seem to be a dynamizer. It bears a strong resemblance to a "short-wave oscillotron" in our collection. It also seems to have been crossbreeding with a violet-ray machine; this is not unknown, as devices such as Holder's Diastatic Condensator demonstrate.



I am enclosing an excerpted illustration. (It is probably from the October 1923 issue of *Science and Invention*.) It shows an exact twin to the dynamizer in our collection. We have to be careful about details like this: People can recognize misstatements and mistakes, but once out of their fields of expertise they can't always tell between pie-on-the-face goofs and stake-through-the-heart lies. This picture of the wrong item is a mistake having the pie nature—but a mistake nonetheless.

In a related note, Bob McCoy's Museum of Questionable Medical Devices has closed, and is in the process of migrating to the Science Museum of Minnesota. It'll end up getting more exposure there, but I can only hope they manage to retain Bob's personality, because Bob himself was a major part of what made his museum so fascinating.

Ellen Kuhfeld, Ph.D.
Curator of Instruments,
The Bakken
Minneapolis, Minnesota

I greatly enjoyed J.D. Haines's article on Albert Abrams and agree that he should hold the title "King of Quacks." Yet there is another physician who is a close runner-up, Dr. John R. Brinkley, who practiced in Kansas in the early part of the twentieth century.

Doc Brinkley made a fortune performing the "Brinkley Procedure" which entailed transplanting the testicles of a specific variety of billy-goat into a man in order to "rejuvenate" him. This surgery was the Viagra of its day and it is suspected that President Woodrow Wilson underwent the operation. The story goes that one of Brinkley's patients while complaining of impotence saw a billy-goat mount a ewe outside of Doc Brinkley's window and told the good doctor that he wished he could perform like the goat. Brinkley said that it wasn't a problem, castrated the goat and stuck the testicles in the man's abdomen. Nine months later the patient's wife gave birth to a baby boy they named "Billy."

Brinkley also operated the most powerful radio transmitter in the country so that he could make his sales pitch into a gold-plated microphone. In addition to the "Brinkley Procedure," he sold a variety of "cures" for every ailment imaginable. The cures were all different dilutions of indigo-blue dye.

You noted in the News and Comment section how the NCCAM is promoting quackery and I fear that we will soon see many trying to assume the title of "King."

Thanks for a great issue.

John E. Dodes, D.D.S.
Forest Hills, New York

In the article on Albert Abrams, it is unfortunate that the name of Stanford University is invoked several times. According to published and online sources I consulted, Abrams never had any affiliation of any kind with Stanford.

Haines refers to Cooper Medical College as "the predecessor of Stanford University." This is about half correct. Cooper was not the predecessor of Stanford University, but it was the predecessor of Stanford's medical school. Stanford University was founded by Leland and Jane Stanford in 1891. Cooper Medical College was founded in 1858. Stanford University took Cooper over in 1908 and made it into the nucleus of Stanford Medical School.

Haines also refers to Albert Abrams as a "Stanford professor." This is completely incorrect. According to online sources (for example, www.premier1.net/~raines/abrams.html), Albert Abrams was a professor of pathology at Cooper Medical College from 1893 to 1898. Thus, his quack writings (which began in 1901) were all published after he left Cooper. Abrams had been gone from Cooper for ten years when Stanford took it over.

Contemporary accounts of Abrams's quackery (such as those in *JAMA* and *Scientific American*) refer to him simply as "Dr. Albert Abrams of San Francisco."

I enjoyed the article, but I wanted to clear my alma mater of the apparently unjustified accusation of sheltering quacks!

Melanie Nickel
San Diego, California

Years of reading the SKEPTICAL INQUIRER has taught me to be very skeptical of all that I read, including the SKEPTICAL INQUIRER itself.

The article by J.D. Haines mentions that Albert Abrams was a professor at Cooper Medical College, with reference to its being a predecessor of Stanford University. In addition, Abrams is referred to as "this Stanford professor."

A brief bit of research on the Internet turned up an online copy of John L. Wilson's authorized history of "Stanford University School of Medicine and the Predecessor Schools, An Historical Perspective." A significant portion of Chapter 26 is devoted to Dr. Abrams. A very specific quote by Ray Lyman Wibur, M.D., as president of Stanford University in 1922, clarifies that Dr. Abrams was never a member of the Stanford University faculty:

> May I call your attention to the enclosed clippings, apparently sent out from your office, indicating that Dr. Albert Abrams is connected with Leland Stanford

> University. The same error has been corrected several times. Dr. Abrams has never had any association with Stanford University. He is a graduate of Cooper Medical College, which was taken over by Stanford University long after his graduation. It is evident that Dr. Abrams, or someone associated with his publicity work, has tried to keep up the fiction of his association with Stanford. It seems to me bad enough for such a responsible institution as the Associated Press to herald far and wide the scientific rubbish of Dr. Abrams, and worse still to connect the name of the University in any way with such absurdities.

In addition, Haines apparently accepts Dr. Abrams's claim of a degree from the University of Heidelberg at face value. However, Dr. Wilson refers to Dr. Abrams supposed credentials as follows:

> "Who's Who in America for 1922–1923 contains a lengthy entry on Albert Abrams, physician: 'Born in San Francisco 8 December 1863; M.D. University of Heidelberg, 1882; A.M. Portland University, 1892; and LL.D. (date and institution not specified).' The M.D. degree in 1883 from Cooper Medical College is not mentioned. When the American Medical Association sought to validate Abrams' credentials, it was found that he had previously given his date of birth variously as 1862, 1863 and 1864; that there was no evidence of his having received an M.D. degree from Heidelberg; and that there was no record of the existence of a "University of Portland" at the time. It would appear that the LL.D. degree was also ephemeral."

Nonetheless, I found the article interesting reading, and agree with its concluding thoughts that today's social climate still is fertile ground for quackery, now in the form of "alternative medicine."

Paul A. Kuckein
Los Altos, California

Thanks for your article on Abrams, the original "black box" quack. I had recently begun reading Randy Shilts' book *Conduct Unbecoming: Gays and Lesbians in the U.S. Military*, lo and behold, on page 15 appears the following paragraph:

> The idea of excluding people for having a homosexual orientation, as opposed to punishing only those who committed homosexual acts, was born during World War I, and advanced by practitioners in the fledgling field of psychiatry. After San Francisco police found a number of soldiers during a raid on a gay club, a San Francisco psychiatrist, Dr. Albert Abrams, wrote in September 1918 that while "recruiting the elements which make up our invincible army, we cannot ignore what is obvious and which will militate against the combative prowess of our forces in this war. . . . From a military viewpoint, the homosexualist [*sic*] is not only dangerous, but an ineffective fighter. . . . It is imperative that homosexualists be recognized by the military authorities."

To my knowledge neither Shilts nor Haines were aware of Abrams's "other" reputation, another strong argument for the widest possible distribution of skeptical reporting.

John Coffin
El Cerrito, California

J.D. Haines responds:

I'm not surprised that the Stanford folks want to distance themselves from Doc Abrams. But they did catch me when I stated Cooper Medical College was the predecessor of Stanford University. I intended to say that Cooper was the predecessor of Stanford's medical school, a division of the greater university. Abrams was a Cooper Medical College professor since Stanford had not yet acquired the college during Abrams's tenure. Many of Cooper's faculty were retained by Stanford when the affiliation began. Fortunately for Stanford, Abrams had departed for "greener fields" when Cooper was acquired. My humble apologies to any Stanfordites unintentionally offended.

Mars Effect a Social Effect?

Geoffrey Dean (May/June 2002) makes an excellent argument that the Mars Effect is really a social effect, the result of parental fudging of true birth hours and dates to those more socially favorable in that era. He makes the point that even if the parents didn't believe in planetary effects themselves, they might have been motivated to give their child an advantage in a society where such beliefs were common.

However, if societal beliefs were so strong that parents would resort to this kind of fakery, then faking would most probably not even be needed to account for a Mars Effect: Children who by chance had auspicious births might be favored by society and given extra encouragement or assistance toward a professional career. They would thus be more likely to appear in a subset of prominent professionals. This "Pygmalion effect" might be small, but, as Dean points out, only a small effect is needed to explain the data.

Thus, Dean's compelling evidence for faking may be symptomatic of a greater social force at work. In general, the stronger the societal belief in planetary influence, the more incentive for parents to fake birth data . . . but also the bigger the Pygmalion effect on the larger mass of unfaked data. The detection of even small amounts of parental faking may therefore have enhanced explanatory power for the Mars Effect.

Robert I. Masta
Ann Arbor, Michigan

I think Geoffrey Dean has come up with a plausible explanation for the "Mars Effect": the changing of recorded birthdays for superstitious reasons.

My brother, sister, and I were adopted as infants through the same Catholic adoption home in Massachusetts. Our adoptive parents were told that I was born on August 8, 1959, my brother was born on November 27, 1960, and my sister was born on February 15, 1964.

In the last five years we have each found our biological mothers. They confirmed the birthdates for my brother and me, but my sister's biological mother said she was actually born on February 13. Was her birthdate changed by the Catholic agency because it was an "unlucky" day? We'll probably never know, but after reading Geoffrey Dean's article I have my suspicions.

August Berkshire
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Barker's Book of Bunk

After reading John C. Sherwood's article "Gray Barker's Book of Bunk" (May/June 2002), I wanted to add my own experiences with Barker, which closely parallel his. I knew Barker, having met him at several UFO conferences and having carried on a correspondence with him over several years. If you sat down with Barker and chatted with him one-on-one, he was surprisingly cordial with skeptics (which is quite unusual for a major UFOlogist). He would more or less admit that most of what he wrote was bunk, that he knew it was bunk, and that he wrote such things primarily for the money. (He is not the only well-known UFO writer to have made such a confession to me.) Barker did have some sort of vague belief that "something odd" was going on, but he was by no means dogmatic about it. He said to me, "If you

want to understand what I really think and believe, you should read my book *The Silver Bridge*" (mentioned by Sherwood). Barker promised to send me the book, and an autographed copy soon arrived. It is not a book that makes wild and emphatic claims about paranormal goings-on. Instead, it is a book about ordinary people in real-life situations, and the difficulties they face. It reaches no firm conclusion. The sightings of Mothman and alleged encounters with aliens are placed within this context. Barker seems to be saying that when people face difficult situations in life, they may turn to such fantasies.

It should be noted that another hoax that Barker helped to promote but did not originate (similar to his role in giving us the *Men in Black*) is *Alternative 3*, which began as an April Fools joke on a British TV network. The premise of the story is that there is a secret space program conducted jointly by the U.S. and USSR (the Cold War being just a hoax diversion) to transport the Earth's elite to Mars to escape a coming ecological catastrophe. Barker's June 1979 column in *UFO Review* claims that this book was "banned" in the United States. However, a trivial investigation revealed that the "ban" simply meant that the Canadian distributor of the book—the first edition to reach North America—did not have the rights to sell copies in the U.S. (see www.debunker.com/texts/alternative3.html). A U.S. edition from a different publisher soon followed. Nonetheless, to this day, the supposedly "banned" *Alternative 3* has become a fixture of conspiracy lore, and will probably remain so for many years to come.

Robert Sheaffer
Lakeside, California

Robert Sheaffer, author of UFO Sightings, *is SI's "Psychic Vibrations" columnist.*

Pterodactyls and Giant Pandas

Massimo Polidoro made several mistakes in his first "Notes on a Strange World" column, "A Pterodactyl in the Civil War"(May/June 2002). First, he wrongly stated that the giant panda was discovered in the twentieth century. Pandas have been described in Chinese writings going back more than 2,000 years. It would be chauvinistically dishonest to claim that an animal is only discovered after a European first stumbles upon one. That would be especially so if one were to dismiss the written history of the Chinese who gave the world gunpowder, fireworks, paper, ink and books, silk, the magnetic compass, spaghetti, and many other technological and cultural advances.

Even if one were to date the discovery of the giant panda from when the first European described it, Polidoro would still be wrong. It was in 1869, when the French Jesuit missionary and zoologist Armand David realized that a panda skin brought to him by a hunter belonged to an animal unknown to Western science.

Polidoro also appears to make the common mistake of including pterodactyls among dinosaurs. Based on widely accepted criteria, pterodactyls and other pterosaurs are not dinosaurs. The only flying dinosaurs were—and are—birds. This is why I would also quibble with the author's statement that dinosaurs "are long gone."

Finally, Polidoro referred to the pterodactyl in the hoax as "the holy grail" of cryptozoologists. There is no cryptozoologist "holy grail." Even if a flock of living pterodactyls were to be discovered tomorrow, it would not provide evidence for the existence of goat suckers, the Loch Ness monster, or any other legendary creature. Each claim must be supported by its own evidence. Scientists at first were skeptical about the existence of duckbilled platypuses. Nevertheless, proof of the existence of platypuses did not prove the existence of unicorns, abominable snowmen, or Pigasus, the flying pig.

Andrew A. Skolnick
Forest Park, Illinois

Any photo that is odd, bizarre, and unusual we should automatically think might be a fake. I'm glad photo experts/Civil War historians were able to pick apart the pterodactyl and Union soldier picture the way they did. Knowing the profiles of your average Union soldier and then observing their wear was a great way to detect some kind of forgery. Some people have plenty of time on their hands to create such a fraudulent picture.

Irene Ayala
Vallejo, California

Wegener's Drift

My compliments to Ralph Estling for a very good article ("The Logic That Dare Not Speak His Name," May/June 2002). His paragraph regarding Albert Wegener and continental drift reminded me of an amusing quotation that I have heard cited.

Supposedly, a reporter was interviewing John Maynard Keynes and challenged Professor Keynes to explain why he had changed his opinion on a particular economic issue. Keynes replied: "The facts changed. Since the facts changed, I changed my position. What do you do, sir?"

Steve Chaffin
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I object to two of the ideas propounded in the article by Estling.

1. Wegener's Continental Drift proposal of 1912 should not have been dismissed out of hand in the period 1912–1950, as the author asserts was proper. It was a plausible explanation of the jigsaw puzzle Africa/South America fit, and was certainly more likely than the alternative, coincidence. Of course, it should not have been accepted either, with no mechanism postulated. But there is room in science for temporary speculation.

2. Theories don't require "proof" for tentative acceptance, just high plausibility and agreement with what is known. The Big Bang, for instance, has not been proven, and may even be found wrong. But it is currently accepted.

Stefan Silverston
Chandler, Arizona

Ralph Estling takes in his column as an example Wegener's hypothesis continental drift, which according to him was "dismissed by almost all geologists of the day." This statement is biased. Only almost all American geologists rejected it. Wegener presented many good arguments for his hypothesis, and many geologists in Europe, Africa and the East Indies accepted the idea. See Edelman 1988 and Oreskes 1999!

References

Edelman, Nils. 1988. *Wegener and Pseudoscience: Some Misconceptions.* SKEPTICAL INQUIRER 12(4), Summer 1988, pp. 398–402.

Oreskes, Naomi. 1999. *The Rejection of Continental Drift.* Oxford Univ. Press, p. 420.

Nils Edelman
Professor emeritus of geology
Abo, Finland

Proposition: There is a misogynist in the Forum section of this publication wearing green tights who believes the year is 1901, women's brains are smaller than men's, and

servants not only are still on the social landscape, but, like those aforementioned women, also have diminished mental capacities.

Proof? What else can I possibly make of the following statement, excerpted from Ralph Estling's article: ". . . but it cannot be printed in a publication that may fall into the hands of women, children, servants, and persons of high moral certitude and rather lower mental prowess."

I was absolutely shocked when I came across this outrageously irresponsible and callous piece of writing. Should I expect more of this from your magazine? Is this perhaps why out of twenty-four letters to the editor, only one is identifiably from a woman—not because of the size of her brain, but because of hostile attitudes hidden in SKEPTICAL INQUIRER? With such a display of retarded social awareness you'll have a hard time wooing me back to your readership.

Naomi Nissen
New York, New York

Ralph Estling responds:

I note that Ms. Nissen says not a word in defense of children, not to mention persons of high moral certitude and rather lower mental prowess. I would like to know therefore why she hates and despises these unfortunates so vehemently. What has a child or person of high moral certitude etc. ever done to her to deserve such outrageously irresponsible and callous treatment? We can only wonder. Indeed, there is a great deal to wonder about in her letter.

Mr. Silverston's objections are largely answered by Mr. Chaffin. Scientists make a sharp distinction between theory *and* hypothesis, *the latter being a plausible guess, the former, as in the Theory of Evolution or the Theory of Relativity, an established scientific explanation for which substantial evidence exists. The Big Bang falls somewhere between; some evidence exists but it is not yet fully proven. The fact that it "may even be found wrong" is enough to show it is not (yet?) a* theory *in the scientific sense of the word.*

Magnetic Mountains?

The short article "Magnetic Mountains" (SI, May/June 2002) purports to present possible evidence of water flowing uphill on a "magnetic mountain" in the Philippines. The photo, however, appears to provide sufficient evidence to debunk such a paranormal hypothesis.

The second photo shows water poured on a road that runs along a 45-degree angle where a component of the displacement is across the road and a component is along the road's length, allegedly uphill. Now, many roads have an upward hump that runs along the middle of the road that slants down toward the edges allowing rainwater to flow off the road, like a slanted roof. You can in fact detect such a central upward hump in this road, and the slant of shoes of those standing on the road show that the road slants downward toward its edges. The water poured on the road runs to the edge it is poured closest to, following the downward slant across the width of the road, exactly as Newton's theory of gravity would predict.

This then raises the question: why would water flow both uphill (in the component of displacement along the road's length) and downhill (across the width of the road) at the same time?

Obviously the logical answer is that it always flows downhill, and it is an illusion that the road's length slants upwards.

Ian Goddard
Rockville, Maryland

It seems to me that the obvious way to solve the problem of the water flowing "uphill" is to place a bubble level on the surface and see which way the surface is tilting. In keeping with Occam's razor, let's look for the simplest explanations first.

Anthony J. Newman
Canton, Connecticut

As a skeptic, I had to laugh at the fact that anyone wants to study the "Magnetic Mountains." As an amusement park fan and historian, I thought you might like a look at the history of the commercial side of these "mysterious" anomalies. The first known attraction featuring a room set akilter was patented in 1905 and the oldest known commercial "mystery spot" still exists in the form of the Oregon Vortex in Gold Hill, Oregon, dating back to the 1930s.

If you would like to learn more about the history of the "tilt house", please see my article at http://dafe.org/attractions/related/tilthouse.htm.

Keep up the great work!

Rick Davis
Vienna, Ohio

Mark Benecke responds:

I like people who laugh (I laugh a lot, too). I also like people who contribute meaningful comments. Thank you very much for both. After the request for reports was printed in SI, dozens of very interesting and intelligent accounts of allegedly magnetic mountains came in. It was very clear to everybody that this is an optical illusion. However, laughing does neither explain nor solve the question why the illusion exists even on photographs, film, etc. Being a forensic biologist, I prefer to look at the scene to measure, and to understand everything myself. This was and is the use of my request. Thank you very much to the numerous people from all around the world who contributed photographs, personal observations, measurements, maps, and of course hints how to measure the angle of curved and at the same time severely bent streets.

Chopra's Exploitation

I'm sure you've gotten sufficient letters already taking SKEPTICAL INQUIRER to task for the section in J.D. Haines's essay "Laughter: The Real Ageless Timeless Medicine" (May/June 2002) in which Haines compares Deepak Chopra's Indian accent to that assumed by Peter Sellers in his brownface role as a faux Indian in *The Party*. I have to say, I really am surprised that such an insensitive gaucherie made it through your usually astute editorial filter.

But I think there's an object lesson here. The very fact that Chopra's alternative medical guru act would bring Peter Sellers to the author's mind is a shameful reflection on Chopra's exploitation of his Indian heritage to bring credibility to what he probably knows full well is unscientific flimflam. Using the mystique of his (to us) exotic ethnic origin to put one over on the American public is what used to be known as Uncle Tomism. It does dishonor to both his people and to all Third World scientists.

Anne Sharp
Livonia, Michigan

J.D. Haines responds:

As a writer, the worst thing that can happen is no response from the reader. So I must conclude my piece on Dr. Chopra was a success, given comments like "racist and fallacious" [in a letter not included here] and "insensitive gaucherie." I am really quite impressed. I want to remind my critics of one small point—this is a humor *piece, folks. It's okay to poke fun at people who are preying upon the public, whatever their race is. Sure I think Dr. Chopra has*

a funny accent. And like I said in the essay, so do I. *Somehow my critics missed this point in their zeal to wave the flags of racism, insensitivity, and gaucherie.*

I happen to be a member of the only minority group that it is politically correct to attack. That's right, I am a white male Southerner. My northern friends think it's funny to call us rednecks, crackers, and white trash. But that doesn't make them racists, just ignorant. I'm not attacking Chopra's race. If my observations that Chopra and Peter Sellers sound alike makes me a racist or insensitive, then my critics need to get busy attacking 99% of all humor writing. My advice to my critics is to lighten up. . . .

On Stephen Jay Gould

With the death of Stephen Jay Gould another candle has gone out.

Gould was a shining example of the Renaissance person our age so desperately needs. He could speak authoritatively on science, music, literature, politics, and sports. He always had an insight that provided a bright, new perspective.

I was privileged to hear him speak some years ago at the Carnegie Institution in Washington, D.C. Without notes he spoke for over an hour to a rapt, standing-room-only audience. It was an unforgettable evening, a true intellectual feast.

Gould was scheduled to speak at Boise State University in October. His insights on science (and on evolution in particular) would have been extremely beneficial in helping us resist the anti-science virus of creationism that threatens Idaho's students.

We had earlier lost illuminaries like Carl Sagan and Isaac Asimov and now we have lost Stephen Jay Gould. As the forces of darkness spin their treacherous webs, reaching out from bases in Teheran, Virginia Beach, and Colorado Springs, we more than ever need the rational reasoned voices of people like Stephen Jay Gould.

We must continue to light candles of rational humanism against the faith-based blackness that threatens to snuff out the light of Western civilization.

Gary L. Bennett
Emmett, Idaho

Spotlight on UFOs

I had the luck to see a truly amazing UFO event. The amazing part was that although the event seemed like a UFO, it came up short on all three counts: It was explainable, it wasn't actually flying, and it wasn't an object.

It was either May 26, 1993, or some other night, when I was driving through the mountains of Tennessee between Chattanooga and Knoxville on Interstate 75. This is an extremely scenic drive during the day, but at night I saw something even more extraordinary. I saw two lights, low in the sky, bright enough to shine through the clouds. At first I thought the lights were low-flying aircraft, but they seemed to hover in one place, then accelerate faster than any human aircraft could. Then the lights disappeared and reappeared soon after in another place in the sky, again hovering, then moving at incredible speeds. Clearly, this was the work of an advanced civilization.

As I moved to a valley in the mountain, I could see that it was two spotlights, projecting onto the low cloud cover, advertising a car dealership's Memorial Day sale. This was the work of a civilization so advanced they had internal combustion engines and electronics available to a wide range of their citizenry. I couldn't see the origin of the lights earlier, because the mountain obscured them. Thus the lights really were "pure energy," but were neither unexplained, nor flying (unless you count beams of photons as "flying"), nor "objects" in the conventional use of the word.

This may explain other "mysterious lights in the sky" that outperform fighter jets, especially on cloudy nights near Air Force bases (with signal lights). Hopefully this letter will help put such similar "unexplained" reports in the ex-files.

Thank you for your time and your noble work.

Scott Takacs, Ph.D.
Scott_Takacs@georgetowncollege.edu

A Nonphysical God?

In Letters, in the May/June 2002 issue Craig Payne writes, ". . . religion thinks of itself as providing an accurate description of reality." And later, "Of course, the reality that religion describes is not physical, which moves the description outside the realm of physical science." I hate to disturb Mr. Payne's convenient dichotomy, but I feel the need to point out that religion(s) *do* attempt to describe the same physical reality as science.

If we agree that "god" exists in a reality that has no effect, measurable or otherwise, on the reality in which we live, then I am happy to leave "god's" existence unchallenged (as Mr. Payne's argument is reduced to a variation on the "undetectable tiger" argument so well refuted by Ralph Estling ["The Logic That Dare Not Speak Its Name," SI, May/June 2002]). Proponents of this "non-physical" god would have to accept, however, that this god cannot affect events in this reality in any way, let alone create it or direct its progress. If the "non-physical" god could do these things (as almost every religion claims it can), then it has physical properties, which are clearly within the realm of scientific inquiry.

If we cannot agree on the total impotence of the "non-physical" god then the boundary between the "physical" and "non-physical" (hallucinatory? delusional?) reality becomes blurred beyond the point where they can be distinguished.

Hulbert Silver
Vancouver, British Columbia, Canada

The letters column is a forum for views on matters raised in previous issues. **Letters should be no more than 225 words.** Due to the volume of letters not all can be published. Address letters to Letters to the Editor, SKEPTICAL INQUIRER. Send by mail to 944 Deer Dr. NE, Albuquerque, NM 87122; by fax to 505-828-2080; or by e-mail to letters@csicop.org (include name and address).

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Beauty in the Eye of Hubble

Like many other so-called planetary nebulae, IC 4406 exhibits a high degree of symmetry; the left and right halves of the Hubble image are nearly mirror images of the other. If we could fly around IC4406 in a starship, we would see that the gas and dust form a vast donut of material streaming outward from the dying star. From Earth, we are viewing the donut from the side. This side view allows us to see the intricate tendrils of dust that have been compared to the eye's retina.

Image Credit: NASA and The Hubble Heritage Team (STScI/AURA)

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